TECHINFORMI

E ISSN 1987–5800

GEORGIAN ABSTRACTS JOURNAL

No. 7(19), 2011

TBILISI

www.tech.org.ge

Contact address: 47 Kostava St., Tbilisi
Tel.: 33-53-15; 33-51-25; 98-76-20
Fax: 98-76-18
E-mail: tech@caucasus.net;
dor@caucasus.net

List of Publications
Reflected in the Present Issue

1. Agrarian-Economic Science and Technologies # 2, # 3, #4, 2010
2. Akhali Agraruli Saqartvelo (New Agrarian Georgia) # 6, 2010
3. Gaenati Herald vol. 3, # 3, 2010
4. Georgian Engineering News #2, 2009; #1, 2010
5. Econonmics and Business # 6, 2010
6. Ekonomisti # 2, 4, 2010
7. Caucasus International University Herald #2, 2010
8. Metsniereba da Technologiebi (Science and Technologies) #10-12, 2009; # 4-6, 2010; # 7-9, 2010
9. Science and Life #1, # 2, 2010
10. Nano Studies #2, 2010.
11. Mining Journal #1(22), #2(23), 2009; #1(24), #2(25), 2010.
12. Works of Academy of Education Sciences of Georgia #1, #2, 2010.
13. Proceedings of the Georgian National Academy of Sciences, Chemical Series, vol. 36, # 1, # 3-4, 2010.
14. Bulletin of Georgian National Academy of Sciences vol. 4, # 1, 2010.
15. Georgian Scientific News #1(5), 2010.
16. Materials of Sukhishvili University International Scientific Conference, 2010.
17. Institute of Water Management, Collected Papers # 64, 2009.
18. Institute of Hydrogeology and Engineering Geology, vol. XVII, 2010.
19. A Human in Bioethical Space and Time. Archimandrite Adam (V. Akhaladze), 2010. 239 pp. (Monograph)

SUBJECT ENTRIES

A. SOCIAL SCIENCES

A1. State and Law. Jurisprudence
A2. Sociology. Demography
A3. Economy
A4. Education
A5. Informatics/Computer Science
A6. Other Social Sciences

B. NATURAL AND EXACT SCIENCES

B1. Mathematics. Mechanics. Physics. Cybernetics
B2. Chemistry. Biology
B3. Geology. Geodesy
B4. Geography. Cartography. Astronomy
B5. Other Natural and Exact Sciences

C. TECHNICAL AND APPLIED SCIENCES. SECTORS OF ECONOMY

C1. Power Industry
C2. Electrical Engineering. Electronics. Radio Engineering. Communications
C3. Automation & Telemetry. Computer Engineering
C4. Mining. Metallurgy. Chemical Industry
C5. Mechanical Engineering. Instrument-making
C6. Light Industry
C7. Food Industry
C8. Construction. Architecture
C9. Agriculture and Forestry. Fishery
C10. Water Industry. Melioration
C11. Foreign and Domestic Trade. Tourism
C12. Transport
C13. Medicine. Healthcare

D. INTERSECTORAL PROBLEMS

D1. Organization and Management
D2. Environmental Protection. Ecology
D3. Statistics
D4. Other Intersectoral Problems

A. SOCIAL SCIENCES

A1. State and Law. Jurisprudence

7.A1.1. Human rights and Georgian law. /M. Surguladze/. Science and Technologies. – 2010. - #7-9. – pp. 122-125. – geo., abs.: eng., rus.
National and international bills regulationg human rights and freedoms are discused. The author shows the importance of the European Convention on Human Rights in Georgian law and in the process of judicial practice.

Auth.

7.A1.2. Trafficking and criminal law. /D. Julukhadze/. Science and Life. - 2010 - №1. - pp. 71-76. - geo.; abs.: geo., rus., eng.
Some peculiarities of articles of the Criminal Code of Georgia imposing liability for trade in humans as well as for trafficking of under-aged are considered; a proper attention is given to the question of the imposition of liability for using services of a victim of trafficking.

Auth.

7.A1.3. Reflection of some theoretical aspects of intellectual property in Georgian legislation. /G. Chiladze/. Science and Life. - 2010 - №1. - pp. 77-81. - geo.; abs.: geo., rus., eng.
The right to invention is an inviolable right of a citizen. Theoretical approaches to natural law and industrial property provided a basis for the first patent laws. Intellectual rights represent the *sui generis* rights. They substantially differ from the property rights to things. The copyright and invention law represent a combination of personal (moral) and property rights. A patent is an individual agreement between the inventor and the state. The inventor is much restricted within the patent rights, yet he can enjoy it without applying to formal invention patenting procedures.

Auth.

7.A1.4. Demarcation between instigation and provocation of felony. /G. Abesadze/. Caucasus International University Herald. – 2010. - #2. –pp.110-120. –geo.; abs.: geo, eng., rus.
The article discusses the problem of demarcation between instigation and provocation of felony. The western criminal law literature provides different opinions about the issue. The investigation particularly distinguishes the Swiss version of culpable participation doctrine, known as the theory of social disintegration. The theory of social disintegration failed to explain the nature of instigation and it left the following problematic situation open. Namely, if the instigator encroaches on the actor's personality, while the actor encroaches on any specific good protected under the special part of criminal law, then the so-called social integration depends on legal good. Thus, demarcation is not participation, as it has an independent good of encroachment. According to this theory, the actor has the same good of such encroachment. Thus, said doctrine in general denies the participation institute and erases the distinction between the instigator and the actor as of accomplices. Provocation of a felony is also the temptation of the actor. Therefore, the concept of intention should also imply a temptation. For qualifying an action under Article 145 of the Criminal Code, the decisive importance is given to the direction of the criminal's intention.

Auth.

7.A1.5. Is revenge a motive or purpose? /R. Kvaratskhelia/. Caucasus International University Herald. – 2010. -#2. –pp.121-126. –geo.; abs.: geo, eng., rus.
The paper discusses whether revenge is a motive of crime or its purpose. Motive and purpose are psychological categories. The criminal law literature considers the motive of crime as the inner condition of a person that pushes him toward an action and guides him during commission of a crime. Some researchers equalize a motive with necessity and thus consider the need that motivates a criminal act to be the motive of crime. Other researchers criticize such a view and treat necessity as a social relationship of an individual towards things, which always exists and is characteristic of any individual according to his/her character, yet not every individual commits a crime. Therefore, based on all the above, motive is the principal or the first ground for commiting an offence. Consequently, we can conclude that the revenge is not a motive of crime but rather the purpose of a criminal action taken by an individual.

Auth.

7.A1.6. Some issues regarding the guilt of a homicide committed in the heat of passion. /G. Mukhadze/. Caucasus International University Herald. – 2010. - #2. – pp. 127-130. – geo.; abs.: geo, eng., rus.
This essay deals with the interests towards homicide committed in the heat of passion that has long existed in Georgian criminology. It is conditioned by two causes: first, by permanent requirement to judiciary practice for precise criteria of qualification of the said act; second, by essential changes in the Georgian criminal law doctrine that required the working out of a new approach towards the problem of guilt. Consequently, Georgian scientists had to review a whole range of conceptions, which failed to meet demands of the

present day. Given complexity of the issue, the authors briefly discuss peculiarities of the attitudes of Georgian scientists to some conceptual approaches, singling out only the guilt's psychological argumentation of the estimation of personality conceptions of victim and the criminal.

Auth.

7.A1.7. An overall performance of the copartnership agreement contents in accordance with Georgian legislation. /E. Ninua/. Caucasus International University Herald. – 2010. - #2. – pp. 131-140. – geo.; abs.: geo, eng., rus.
The work, based on Georgian civil legislation of the soviet period and special literature, provides a general description of a partnership agreement contents. Emphasis is made on the agreement's essential terms, as one of the basic principles of the partners' rights and responsibilities, focusing on a contribution to the common business and on the things contributed; also discussed is the legal fate of common property with regard to the ownership, use and handling. The work also views some issues related to the agreement made in favor of third parties favor and the rights arising out of it. The last part is dedicated to the joint activity management and types, special attention being paid to legal and contractual rules; the same part deals with the cases of deprivation of a partner of the authority of management. Finally, the the necessity of making a written agreement and its results.

Auth.

7.A1.8. Elements of crime and the structure of criminal law norm. /G. Kobalia/. Caucasus International University Herald. – 2010. - #2. – pp. 141-146. – geo.; abs.: geo, eng., rus.
The transition of countries from the authoritarian regime to democracy and rule-of-law state might be considered to rest upon the legal reform. When defining the legislative strategies the actual legal practice should be taken into account. The paper aims at contributing to the establishment of the unified legal practice. The Criminal Code of Georgia tends to liberalize the penal policy. It should be mentioned that while enforcing a whole range of provisions provided therein the principles of justice and legality should be adhered to. When defining the elements of crime, the legislator criminalizes the act in question. This is what is implied by the guarantee and legality function of criminal law: *nullum poena, nullum crime sine lege*. Through contrasting and diversified standpoints the paper highlights the author's view on the structure of a criminal law norm in the context of the problems of *corpus delicti*. Based on the value philosophy the place and role of *corpus delicti* in the structure of a norm is identified.

Auth.

7.A1.9. International standards of independence of judiciary. /B. Savaneli/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 25-28. - geo.; abs.: geo., eng.
The report is dedicated to the necessary of implementation of International Standards of Independence of Judiciary in Georgia. Civilized humankind has established the International Standards of Independence of Judiciary, which have been enshrined in "Basic Principles on the Independence of Judiciary" adopted by the Seventh United Nations Congress on the "Prevention of Crime and the Treatment of Offenders" of July 4, 1998, and Recommendation number R (94) 12 adopted by the Committee of Ministers of the Council of Europe on 13th October 1994. Judiciary, first of all, exercises its functions effectively when being independent from the legislative and executive branches based on the principles of separation of powers. In order to exercise functions effectively, judiciary shall meet the following requirements: judges should be incorruptible, impartial, independent, beyond reproach, and industrious; they should have minimum 15 years of practical experience in the field of law; the elected judges should have intellectual and analytical ability; sound judgment; decisiveness, communication skills and authority, as well as the following personal qualities: integrity, fairness, understanding of people, sound temperament, courtesy and humanity.

Auth.

7.A1.10. Suspension of an individual judicial administrative act in the administrative procedure. /G. Giorgadze/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 29-31. - geo.; abs.: geo., eng.
The article describes the types of lawful and judicial suspension of an individual judicial administrative act prescribed by Article 20 of the Code of Administrative Procedure of Georgia, as well as the cases of negative and unlawful practice of suspension of such acts by courts.

Auth.

7.A1.11. Changing people in obligations. /I. Balakhashvili/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 36-39. - geo.; abs.: geo., eng.
It is possible that the obligation performers may not coincide with obligors. Subjects of obligation are not always creditor and debtor, and the obligation may be both performed and accepted by another person. As a rule, the debtor itself executes the obligation, but the creditor can be offered the execution by a third person - not party to this obligation relationship. The original parties to the obligation may be changed by other people. The change of a creditor is called assignment, or cession, and the change of an obligor- the change of an obligation.

Auth.

7.A1.12. Actual aspects of improvement of a legal system reulating national fiscal relationships. /Z. Amilakhvari/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 40-47. - geo.; abs.: geo., eng.
The article, discusses legal norms regulating national fiscal relationships and mistakes made in their development and adoption that affected fairness and efficiency of the national legal system. Based on analysis of the tax and customs legislation, also legal norms regulating payables for services provided by legal entities of public law, various proposals and recommendations for their improvement are provided. According to the author, the assignment of the legislative control function to the constitutional court, also the provision of any individual with the right to appeal against any courts decisions in the constitutional court will further the State 's legal development.

Auth.

7.A1.13. Complicity in robbery. /M. Lomsadze/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 48-51. - geo.; abs.: geo., eng.
The work "Responsibility for Robbery" is not novel in the Georgian criminology, but there are still some points to be studied in detail in reference to the above subject, namely such issues as the elements of robbery, the problems of robbery qualification, inchoate robbery, and complicity in robbery. The work will be of assistance to professional lawyers, students and all those interested in the problematic issues in connection with robbery.

Auth.

7.A1.14. Survey of the state of the so-called post-war border villages. /A. Tavakarashvili/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 52-58. - geo.; abs.: geo., eng.
The issue was investigated from the fall of 2008 to the end of 2009 within the framework of a research project under the UN Women's Fund, UN Human Rights High Commissioner's Office and the Representation of the Council of Europe in Georgia. Accordingly, it reflected the reality of the post-war period, accompanied the life of the population in the occupied villages, that is how their living conditions have changed and how their safe are their lives. The work ends with recommendations and proposals for future actions on the part of the Georgian government in improving the existing situation.

Auth.

7.A1.15. Mercy killing. /I. Mamestsarashvili, S. Mamestsarashvili/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 69-71. - geo.; abs.: geo., eng.
The act of mercy killing specified by Article 110 of the Criminal Code of Georgia is the subject of debate among criminologists, practicing lawyers and medical workers. In the author's opinion, such debates and arguments for and against are necessary for establishing the truth and legal handling of the problem of euthanasia at a global scale.

Auth.

7.A1.16. The pedagogical and psychological aspects of the lessening of criminal discretion of juvenile delinquents from 14 to 12 years. /I. Bukhuleishvili/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 72-75. - geo.; abs.: geo., eng.
The pedagogical and psychological problems of the lessening of criminal discretion of juvenile delinquents from 14 to 12 years of age and the searching of ways and means of working with them are of great urgency today. The article critically analyzes the necessity of lessening criminal discretion in juvenile delinquents and suggests that such measure would create much more problems in fighting juvenile delinquency.

Auth.

7.A1.17. Analysis of computer crime. /T. Chaligava A. Beroshvili/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 467-470. - geo.; abs.: geo., eng.
In the 21st century, computer crime is one of the most dangerous crimes. It harms individuals, corporations, the State, private organizations and business, security of the country. A strict legislative base and powerful mechanisms of protection of modern computer facilities and technologies are to be created.

Auth.

7.A1.18. Structure of the theft basic composition in accordance with the normative composition of criminal law. /M. Jamalov/. Caucasus International University Herald. – 2010. - #2. – pp. 147-155. – rus..; abs.: eng., rus.
The survey considers basic elements of theft. The relevant definitions of some foreign countries are critically analyzed, the shortcomings of the psychological theory of guilt that prevail in the post-Soviet republics up to the present are considered. The views of some foreign scientists in support of the dominating German normative theory are discussed. The basic elements of theft are enumerated.

Auth.

7.A1.19. Elements of objective side of theft. /M. Jamalov/. Caucasus International University Herald. – 2010. - #2. – pp. 156-167. – rus..; abs.: eng., rus.
The basic elements of the objective side of theft are presented by specific act – secret withdrawal of another's movable thing for the purpose of illegal appropriation. Consequently, the definition of "theft" that was widely adopted in the post-Soviet republics is critically described. The term "theft" is quite vague and doesn't answer the demands of modern civilized science of developed countries. It is not known either by Azerbaijan Civil Code. Article 203.3 of the Azerbaijan Civil Code prohibits the withdrawal of property from the owner. That is why the term "withdrawal" in this case is quite logical. The objective composition of theft involves immanently the purpose of carrying out the act and it is not accidental, because the purpose of breaking the legal prosperity always defines the lack of objective truth and presents its objective criterion. The given survey describes critically the various subjective theories of consequence as well. The special attention is paid to the problems of causal connection establishment.

Auth.

7.A1.20. Struggle against terrorism under conditions of globalization. /M. Aleskerov, S. Veliyev, H. Musayev/. Caucasus International University Herald. – 2010. - #2. – pp. 168-186. – rus.; abs.: eng., rus.
The article considers the questions of struggle against the international terrorism under conditions of globalization. The relevant international legislations, a role of the United Nations, and the strategy of struggle against the terrorism of EU, Germany are considered. The tactics and strategy of the Ministry of National Safety of the Republic of Azerbaijan in the struggle against the international terrorism are given and examples are presented. The research considers the actual results of joint activity of special services of Russia, Georgia, and Azerbaijan in the struggle against this international evil.

Auth.

A2. Sociology. Demography

7.A2.1. Problems of birth rate in Georgia. /M. Khmaladze/. Economics and Business. – 2010. - #6. – pp. 77-82. – geo.
In the past, high birth rate in Georgia was the consequence of high mortality rate as a result of hungar, wars and epidemics. Until 1991, birth rate in Georgia was quite enough to secure expanded reproduction of Georgian population. Since 1991, the birth-rate in Georgia has failed to ensure even a simple reproduction of the population, let aloneteh the expanded reproduction.

Auth.

A3. Economy

7.A3.1. Study of economic growth through microeconomic models. /P. Gomtsyan, A. Arakelyan/. Georgian Scientific News. – 2010. - #1(5). – pp. 45-48. – rus., abs.: geo., eng., rus.
Optimized microeconomic mathematical models are proposed by means of which the trends of economic growth at the macroeconomic level in the short run are explained. Determination of the optimal variant of the benefit distribution between savings and consumption is urgent especially under conditions of overcoming the financial-economic crisis and post-crisis development of the economy

Auth.

7.A3.2. Dynamics of foreign direct investments in Georgia - assessments of national economy. /G. Khantadze/. Science and Life. - 2010 - №1. - pp. 38-46. - geo.; abs.: geo., rus., eng.
As the official data demonstrate, the total Foreign Direct Investments (FDI) of Georgia by 2009 amounted to 759.1 million USD (preliminary). The state regulation of investment processes is the totality of the forms and methods that provide: the unity of private and state interests; the formation of rational proportions among usage, accumulation and investments; the correlation between predictions of an investment market, indicative regulation. The essence of the principles of indicative regulation consists in harmonization of private capital and state interests by development of agreed objectives and guiding lines, as well as of their implementation.

Auth.

7.A3.3. Investment and questions of its estimation in calculation. /L. Sadaghashvili, G. Nanuashvili/. Science and Life. - 2010 - №1. - pp. 47-50. - geo.; abs.: geo., rus., eng.
The article "Investment and Questions of its Estimation in Calculation" deals with the role and significance of investments in Georgia, gives the statistics of incoming foreign investments, the essence of investment estimation, the cases of its recognition and the possibilities of investment estimation after the recognition. Also highlighted are the investment-interfering factors, the absence of legislative acts, and other cases. The

significance of taxation of the made investment projects for ensuring the state budget revenue, selecting a real cost model for all investment assets is considered.

Auth.

7.A3.4. The trustworthiness, liquidation and issues of perfection of solvency of a commercial bank. /L. Jangulashvili/. Science and Life. - 2010 - №1. - pp. 65-70. - geo.; abs.: geo., rus., eng.
The bank liquidity is determined by balancing its assets and liabilities, the compliance of the terms of assets disposed and liabilities attracted, while the solvency includes the possibilities of the bank to meet tax obligations timely and completely through the operations of trade, credit and monetary sources. Based on the above, the liquidation and solvency should be implemented by the bank on the basis of a strategy worked out in advance and targeted at the preferential tasks of the bank's development.

Auth.

7.A3.5. Globalization, economic theory and Georgia. /R. Asatiani/. Works of Georgian Academy of Economic Sciences. – 2010. – vol. VIII. – pp. 121-149. – geo.; abs.: geo, eng.
The article states that the recommendations that formed the basis for the economic development of Georgia failed to answer the actual economy development level and national interests. This is the main reason for failure of economic reforms. There is not a single country in the world where the economic policy was not based on the Keynesian model of growth. The main reason for the global financial crisis is in the lack of macroeconomic regulation, restriction of the government regulation of the credit policy and expansion of the virtual economy. The Friedman's monetary policy has played the biggest role in this. Today, every country has suffered from the global crisis with negative effect on economic growth and aggregate supply rate. Logically, the postulates of the Keynesian theory are resurrected. This could be seen in active involvement of government in regulatory activity, increase of social benefits, decrease of taxes and financial aid to the businesses.

Auth.

7.A3.6. Competition as backbone of the national economic policy. /Sh. Gogiashvili/. Science and Life. - 2010 - №2. - pp. 10-15. - geo.; abs.: geo., rus., eng.
The necessity of government regulation of any economy arises from the economic requirements, and the market with its profit-oriented nature is truly powerless before these requirements. Only the scope and intensity of regulation can be disputable. The competition, being the backbone of a market economy and the basis of state economic policy, provides for its (economy) efficiency, human rights and personal rights. At the same time, the competition may not be maintained automatically and is ousted by monopolies if the state fails to take special measures in order to protect the competition.

Auth.

7.A3.7. Self-management – the highest level of management. /I. Maisuradze/. Science and Life. - 2010 - №2. - pp. 23-30. - geo.; abs.: geo., rus., eng.
The article deals with the importance and advantages of being competent in the methods of self-management and behaviour, in choosing the right direction to be followed by all good manager leaders. Only if we develop the qualities, habits and skills enabling us to manage ourselves and other people, we shall be able to secure an efficient and result-oriented work.

Auth.

7.A3.8. International capital and production under the world economic crisis: tendencies and perspectives. /I. Manvelidze/. Science and Life. - 2010 - №2. - pp. 31-38. - geo.; abs.: geo., rus., eng.
Following the establishment of the industrial nucleus of globalized world economies, the geography of international investment flow is changed, because the character and role of foreign direct investment (FDI) changes according to regions and has its own specificity; accordingly, the latter determines the intensification level of the FDI's flow. One of the main problems among the factors influencing the world investment flow is the possible crisis in world economics, which by its character and scale may be global, regional or local. The global economic crisis is extremely negative, directly hitting all the branches of the world economic and international financial and economic relations. The 2008 world economic crisis is the typical example. According to the estimation of the UNCT experts, multinational corporations expect to gradually increase their FDIs in 2010, reaching the level of 2008 in 2011. The leaders in future growth of FDI will be the USA, Brazil, India, China and Russia.

Auth.

7.A3.9. Tea-growing and tea industry integration and a strategic program of their sustainable development. /O.Keshelashvili, M.Nikoleishvili, M.Mechurchlishvili, E.Dzagania, D.Mamukelashvili, N. Damenia, M. Sardlishvili/. Agrarian-Economic Science and Technologies. – 2010. – #4. – pp. 13-16. – geo.; abs.: geo.; eng.
For the first time in Georgia, a multi-component and multi-optional strategic program of the tea-growing and tea-industry integration and sustainable development, as well as the mechanism of its implementation and rational utilization will be developed as a system of economic and organizational recommendations in line

with the requirements of a market economy. The scales and demands of the use of the research results will gradually grow, leading for the future development of integration process and the quantitative growth of agroindustrial formations and their area, which undoubtedly seems to be a positive trend.

Auth.

7.A3.10. The contemporary interpretation of intensification of production. /J. Bazhunaishvili/. Agrarian-Economic Science and Technologies. – 2010. – #4. – pp. 28-31. – geo.; abs.:geo.; eng.
In the article the author's view of contemporary understanding of the intensification of agricultural production is highlighted. We consider that the essence of intensification is not in 'inputs', i.e. extra investments before production (extra investments) and not in 'outputs' upon completion of production, but in the change of functioning of the production system. We believe that intensification enhances the strain of functioning of the production system. Thus, the process of intensification of agricultural production is enhancing the strain of functioning of the production system by employing its potential thoroughly. In this explanation two types of this process are singled out. The first type is increasing the strain of production system trough using its potential or strength of separate resources. This type can be called a relative intensification. It is limited by the size of production potential and the resources of individual elements of production. The second type of intensification is connected with the increase of production potential. This type includes enhancing the strain of the production system functioning at the expense of its progressive structural and functional reorganization and development which is accompanied by improving the economic and production quality of the system on the basis of enhancing the production potential. This type can be called absolute intensification.

Auth.

7.A3.11. The main principles of improvement of the investment environment in Georgia. /G. Dogonadze, J. Makharadze/**.** Agrarian-Economic Science and Technologies. – 2010. – #3. – pp. 64-71. – geo.; abs.:geo.; eng.
A growth in foreign direct investments has been noted in Georgia since 1996, although in 2008 the inflow of investments decreased by USD 450, 9 million as compared with 2007, the main reason of which are the 2008 August events. In the second and third quarters of 2009, a stable tendency for investment growth was noted. Analysis of different sectors of economy shows that agriculture is not attractive for foreign investments; for example, in 2007, a share of agriculture in foreign direct investments made 0.7%, and only 0.5% in 2008, amounting to USD 7.8 million, which shows the necessity for improvement of the investment environment in Georgia.

Auth.

7.A3.12. Important and original definitions for economy and business. /O. Keshelashvili/**.** Agrarian-Economic Science and Technologies. – 2010. – #2. – pp. 6-21. – geo.; abs.: geo.; eng.
The author proposes own original and important scientific definitions of: 1. Business; 2. Business philosophy; 3. Informational technologies; 4. Attitude to business in Georgia; 5. Verbal management; 6. Importance of science and innovation ("Knowledge-based Economy"); 7. Globalization; 8. Economic-technological environment; 9. Economic technologies as a new economic category; 10. Institutional systems and economic mechanism; 11. Intensive development of production and its importance.

Auth.

7.A3.13. Economic assessment of an aggregate according to its energy criteriua. /R. Makharoblidze, G. Chitaia/**.** Agrarian-Economic Science and Technologies. – 2010. – #2. – pp. 35-42. – geo.; abs.: geo.; eng.
The effectiveness of a technological process of agricultural crops growing and harvesting is estimated by the correlation of the cost of the yield with the cost of the work performed. The cost of the performed work and production expressed in monetary units is directly related to the market conjuncture and inflation indicator, which determines the efficiency value, which is different in each individual moment; therefore, its application in comparing general technologies and individual machine operations is less effective and may cause an estimation error. Therefore, when estimating technological processes, it is necessary to select an indicator which is constant and depends only on the technical and economic characteristics of the aggregate. Such indicator is the consumption of energy necessary for the process fulfillment per unit of cultivated area.

Auth.

7.A3.14. The services market in a mixed economy. /V. Kiria/**.** Gaenati Herald. – 2010. – vol. 3, #3. – pp. 19-25. – geo.; abs.: geo.; eng., rus.
The article deals with the services market as the area of exchange of the results of work in the nonproductive sphere of the economy. The peculiarities of the services market are given and the necessity of its regulation buy the State is justified.

Auth.

7.A3.15. The organization of electronic trade/commerce and prospect of its development. /K. Mdinaradze/**.** Gaenati Herald. – 2010. – vol. 3, #3. – pp. 36-45. – geo.; abs.: geo.; eng., rus.
The work the organization and development of e-commerce through the Internet, focusing on the efficiency of such online electronic trade. Different sources speak of the growing popularity of e-commerce; numerous Internet shops offering diverse products and fast servicing are being established. The contemporary business environment is hardly perceivable without e-commerce. The current tendencies of development of this new sector of economy – electronic commerce – are rather promising and evidence its growing role in the world and national economies.

Auth.

7.A3.16. Financial leverage - effective tools for corporate management. /Kh. Barbakadze/. Caucasus International University Herald. – 2010. - #2. – pp. 187-190. – geo.; abs.: geo, eng., rus.
One of the key elements of a market economy is the knowledge of the main mechanisms of the income generation, its analysis and application of the modern methods in planning. One of the main mechanisms for realization of it is the financial leverage. The financial leverage foresees utilization of the fixed costs and is characterized by usage of loan capital by a corporation influencing the net profit ratio. The financial leverage is the objective factor, originated under the loan capital equal to the utilized assets that give the opportunity to generate additional income from own capital.

Auth.

7.A3.17. Innovations in sales strategy of banking services. /E. Gogorishvili/. Caucasus International University Herald. – 2010. - #2. – pp. 191-196. – geo.; abs.: geo, eng., rus.
The process of effective sales management is the aim of economic innovations. For this reason, it is very useful to focus on innovations in the field of banking products, sales forms and methods. The main forms of sales are classified as static when the client is served in the office and the bank is selling traditional bank products, and as remote when clients are served through modern electronic facilities. A strategy allows the optimal use of sales planning and bank resources. It provides the better understanding of user expectations and market assessment. Clients feel that the bank is able to satisfy their diverse requirements. Hence, it is clear that customer's confidence in the bank shall be determined by a number of products purchased and general interest level of integration. Therefore, the banks that maintain relations with the client in the joint business framework receive the greatest benefit.

Auth.

7.A3.18. Prospects of corporative development. /A. Gabrichidze/. Caucasus International University Herald. – 2010. - #2. – pp. 197-200. – geo.; abs.: geo, eng., rus.
The issue of corporative development and functions is the important element in the company’s structure. The corporative deals related to the acquisition and sale of assets are integral parts of the competitive strategy. For business development and expansion companies are using any type of deals and their importance is increasing; at the same time, the responsibility of the board of directors on corporative development is widening. The practice of countries with developed market economy in this direction covers actions and problem solution methods, which ensure the positive effect and high quality of deals, as well as their relevance toward the company’s tasks and mission.

Auth.

7.A3.19. Corporate financial planning. /T. Gamsakhurdia/. Caucasus International University Herald. – 2010. - #2. – pp. 201-206. – geo.; abs.: geo, eng., rus.
The article considers the place of financial planning in the general system of corporate governance, the basic methods of the purpose and elements of financial planning of the company are defined, and the process of financial planning and its interaction with firm strategy are analyzed. The financial planning of companies allows formulating of measurable key indicators of the business purpose, planning of activities base thereon, supervising resources during performance, and analyzing the reached results. As a whole, the financial planning allows to lower the system risks upon development of a company and deterioration of a conjuncture at the expense of rationing of resources and increase of the level of financial control in the company.

Auth.

7.A3.20. Insurance market and insurance supervision in foreign countries. /N. Kakashvili/. Caucasus International University Herald. – 2010. - #2. – pp. 213-216. – geo.; abs.: geo, eng., rus.
The institutional model for the supervision of financial activities operates in Italy, Portugal, Greece, Slovenia, etc. The functional and mixed models are operating in the Netherlands, Luxemburg, Australia, etc. An integrated model works in the majority of states (Great Britain, Denmark, Belgium, Poland, Czech Republic, and Estonia). One of the preferences for the integrated approach is a high level of independence of the supervisory service. In most countries (e.g., Czech Republic, Bulgaria, etc.), the financial supervisory agencies are accountable to the Parliament (Assembly). In some countries, such as Belgium and Finland, the national government and central bank participate in staffing the management of supervisory agencies on a parity basis. Since December 2009, the NBG has been supervising insurance companies in Georgia.

Auth.

7.A3.21. Credit risks management and assessment criteria. /N. Saralidze/. Caucasus International University Herald. – 2010. - #2. – pp. 222-226. – geo.; abs.: geo, eng., rus.
A credit risk is the most important banking risk, as the inappropriate assessment of the borrower leads to the origin of problematic debts and losses. The credit risk assessment is of a special importance and generally risk management systems are established and function at banks for this purpose. In making a credit risk management system, banks generally rely on own and foreign experience. For many decades, the European and US banks are actively using and developing the credit risk assessment approaches. Therefore, the implementation of a credit risk management system without studying and understanding the models developed in foreign countries would be unreasonable. The developed by the Basel Committee "Revised Scheme of Capital Calculation Approaches and International Standards" - Basel-II, is the basis for regulatory processes in European countries. The document contains all the findings of the new credit risk management, which allows for the establishment of an effective credit risk management system.

Auth.

7.A3.22. Estimation of investment attractiveness of the Autonomous Republic of Adjara. /V. Glonti, S. Megrelishvili/. Economics and Business. – 2010. - #6. – pp. 89-98. – geo.; abs.: eng.
The article presents the methods of estimation of the investment climate incorporating the objective possibilities (investment potential) of a country and regions as well as the investment activity conditions (investment risk) after the example of the Autonomous Republic of Adjara. Based on the carried out analysis, the investment risk in the republic Investment is twofold less than in Georgia on average. Although, for raising the level of objectivity, it is necessary that a system of reliable statistics and calculations be implemented by applying the universally recognized methods.

Auth.

7.A3.23. Economic policy of Georgia determiner of national competitiveness. /G. Erkomaishvili*/.* Economics and Business. – 2010. - #6. – pp. 69-76. – eng.; abs.: geo.
Georgia must have priorities not only in traditional fields but also in high quality, high-tech and high productive spheres as well. Only in this way it will be possible to increase the competitive long-term, irreversible growth, boost revenues and salaries, and improve living conditions of the population. We may name, for example, manufacture of pharmaceutical products, telecommunication devices, gadgets and installments. The focus should be made on high-tech and valuable products. Lately, a demand for plant – based preparations has increased globally. Accordingly, demands for medicinal plants have also increased. Georgia can occupy a well-deserved place in this respect, provided there is the necessary support on the part of the State. The reasonable application of medicinal plants will facilitate the recreation of the state economy, boosting of export revenues, and creation of jobs and reduction of the number of population being on the verge of poverty. The state support should be reflected in the provision of an appropriate legal base and in the elaboration of a correct policy. The current state policy for tourism development should be directed to the maintenance in the sector of existing liberalization and facilitation of investments. The State ought to establish the favorable investment environment to attract both local and foreign investors. One of the priorities of Georgia is its transit function which, together with natural-climatic conditions, the intellectual potential, and other factors should ensure the business development in and enhance economic competitiveness in the country.

Auth.

7.A3.24. Georgia's economy amid global crisis. /N. Khaduri/. Economics and Business. – 2010. - #6. – pp. 31-40. – geo.; abs.: eng.
The signs of the global financial crisis have begun to occur in the world since the second half of 2007. The situation in Georgia was worsened by Russian military aggression. However, in autumn 2008, at a donor conference in Brussels an unprecedented decision was made to grant Georgia with 4.5 billion USD. The purpose of this solution was to mitigate the effects of the crisis and the war, but despite the financial assistance, in the wake of the crisis unemployment rate in the country has increased, there has been a decrease in foreign direct investment and real GDP (by 3.9%), Georgia's foreign debt has almost doubled and reserves of the National Bank of Georgia have reduced. Unfortunately, in times of the crisis the government had no anti-crisis program, and the actions performed by the authority of the country were mostly spontaneous and mutually exclusive. For prevention of the crisis in future, it is important to study not only external but also local sources of the crisis.

Auth.

7.A3.25. The importance of acknowledging causative relation between intuitive skill and intellectual thinking in integration policy formation process. /G. Todua/. Economics and Business. – 2010. - #6. – pp. 10-30. – geo.
In the presented article, intuitive skill is considered to be the greatest contemplative wisdom granted to the humans from the Almighty. The importance of such cognition is immeasurably great in human history.

However, it is also natural that through time, priorities of investigating mysteries of natural phenomena have been settled upon achievements of intellectual or conceptual thinking. In conclusion, progress of the world civilization has been conditioned by the acknowledgement and development of causative relation between intuitive skill and intellectual thinking, which resulted in contemporary highly developed information society. The article provides substantiations about high importance of successive acknowledgement of the unity of intuitive skill and intellectual thinking for creation and implementation of proper integration economic policy. Integration value gained in this way is one of the central problems, which should attract the attention of distinguished scientists and politicians.

Auth.

7.A3.26. Business and competition. /J. Tolordava/. Economics and Business. – 2010. - #6. – pp. 83-88. – geo.; abs.: eng.
Article discusses the issues of development of competition strategies. Attention is paid to two types of competitive advantages: reduction of expenditures and diversification of activities. The article points out the ways which can be used to reduce expenditures and to implement diversification strategies. The article also analyzes the methods that combat today widely spread dishonest competition.

Auth.

7.A3.27. On Milton Friedman's monetarist rule. /M. Chikobava/. Economics and Business. – 2010. - #6. – pp. 41-50. – geo.; abs.: eng.
Keynesian and monetary concepts are considered. The Keynesian monetary regulation of inflationary character for a long-term period is underlined. Also, the monetary rule (Friedman's equation) is analyzed, which provides conformity of rates of increase of money supply and real GDP to check rates of inflation. It is shown that on the basis of Friedman's equation, monetary regulation not only practically but also theoretically fails to satisfy non-inflationary development of economy for the long-term period that acts as one of the main reason of modern economic global crisis.

Auth.

7.A3.28. The peculiarities of accounting of non-commercial juridical persons. /L.Grigalashvili/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 78-80. - geo.; abs.: geo., eng.
The issues of accounting of non-commercial juridical persons are discussed in the work. For the purpose of unification of registration of commercial and non-commercial business, we, based on the standards of accounting, worked out a plan of accounting records, according to which the business of a juridical person is divided into "general activities" and "commercial activities". Accordingly, the methodology of incomes from the budget and commercial activities are shown.

Auth.

7.A3.29. Monopolism and economy of Georgia. /L. Sadaghashvili, S. Sreseli/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 85-87. - geo.; abs.: geo., eng.
The work contains an analysis of such important questions as the significance of monopolization and its influence on the economy of Georgia. It shows the negative sides of monopolism and their results, which serve as a basis for weakening the economy. The setting up of an antimonopoly service will help to strengthen the Georgian economy, to eradicate tendencies of rise in prices that will be positively reflected on population, to control all profitable businesses in Georgia. Large companies artificially decrease prices in order to make small companies bankrupt and incorporate them. Following it, they start to offer their prices to customers and dictate their own rules that adversely affect every customer.

Auth.

7.A3.30. The role of foreign investments in Georgian economy. /L. Osadze, M. Sosanidze/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 105-108. - geo.; abs.: geo., eng.
The article focuses on the necessity of studying the investment climate and the carrying out of a respective investment policy for economic development of Georgia. In order to attract foreign investments, Georgia should create the appropriate economic and legal environment through improvement of tax, credit, customs and tariff systems. When introducing benefits for foreign investors, account should be made of the level of profitability of the given sector. In low-profitable but important for the country sectors the benefits should be higher. The investment policy should also take into accounts the regional interests

Auth.

7.A3.31. The role of financial management in the development of business. /N. Gagnidze T. Tsintsadze/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 124-126. - geo.; abs.: geo., eng.
The role of finance management and the importance of place in the business development are discussed in the article. The finance manager is the important figure in foreign developed countries and his/her knowledge and experience is the guarantee of success of any business. The production activity of any organization depends on the correct administration of finances, optimal and exact business plan, good choice of strategy

and tactics which are the most important guarantee for business development. As business enterprises do not have a long-time history in Georgia, the experience of financial management is also imperfect, especially during inflation, change of currencies, etc.

Auth.

7.A3.32. The essence of innovation and its role in increasing competitivenes. /G. Merlany/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 127-131. - geo.; abs.: geo., eng.
In case of market relations, market demand for production and service and orientation on consumers have entirely changed approaches towards innovation. The article deals with the basic questions of innovation, classification of the milestones of innovation, and its links with competitiveness, marketing, the living cycle of production, on which the profit of firms is dependent. The work begins with the definition of innovation as the last phase of scientific–technical progress and with the approaches of the scientists who have played a great part in explaining the essence of innovation. As a result of different research carried out by many scientists and taking into consideration the world standards, innovation should be discussed as the last phase, the last milestone of scientific–technical progress, which has the practical usage in the production and/or service sector. The experience of developed countries shows that the process of innovative and marketing activity goes without interruption and in anticipation of the stages of a new product design, development, and perfection.

Auth.

7.A3.33. Characteristics and peculiarities of informatiin society economy. /E. Lagvilava T. Chaligava/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 471-477. - geo.; abs.: geo., eng.
Multifarious names of information society economy point out that the term has not been finally specified, because rapidly changeable processes in developed countries do not allow for making an unambiguous definition. Such terms as information economy, new economy, virtual economy, knowledge economy, also innovation economy, and some others are synonyms that differ by peculiarities of different aspects of their consideration.

Auth.

7.A3.34. Information society and human potential. /T. Chaligava, B. Chaligava/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 485-487. - geo.; abs.: geo., eng.
The formation of material capital, accumulation of human capital and technical progress are closely interconnected in an information society. The information and communication technologies influence the human potential. Therefore, the unity of market relations and human values should be ensured when developing the national policy and strategy. The role of information technologies in the development of the human potential should not be disregarded.

Auth.

7.A3.35. Methods of calculation of economic efficiency and optimal allocation of funds for protecting soils against erosion. /T. Zeinalov/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 99-103. – rus., abs.: geo., eng., rus.
The paper describes the calculation methods to avoid or mitigate soil erosion caused by water and to increase the guaranteed allocation of lands. We have developed and proposed a mathematical model and calculation technology to facilitate the efficient allocation of funds for protecting soils against erosion. The calculation technology proposed ensures the reduction of topsoil washout. Irrigation with the use of a soil protection technology provides for reduction in the length of irrigation ditches and the cutting of additional ditches, as well as a rise in wages of the service staff.

Auth.

7.A3.36. Features of the modern economic crisis in Russia. /V. Papava, T. Tapladze/. Ekonomisti. – 2010. - #2. – pp. 5-9. – geo.; abs. eng.
The impact of the global financial crisis on Russia's economy was already observable in the summer of 2008. With most of the necroeconomic enterprises being concentrated in the industry sector, it should not surprise us that the decrease herein is the most significant as a result of the economic crisis. The economic crisis which developed in Russia is not so much due to foreign factors but, rather, to the unsolved problems which have accumulated and which are characteristic for Russia's industry and for the economy as a whole. The technological backwardness of Russia is a key factor due to which the share of energy resources in Russia's export structure of industry is significant. In order to provide real support, the Government of Russia started to carry out measures characteristic for the process of zombieying the economy. As for the application of the Law on Bankruptcy in Russia, it is beneath criticism. It is apparent that the anti-crisis measures carried out by the Government of Russia facilitate the retaining the enterprises with obsolete technologies which can only negatively affect the economic development of Russia in the post-crisis period. The anti-crisis programme of the Government is directed towards a comprehensive zombieying of the

Russia's economy. Due to the large-scale of the necroeconomy in Russia, the zombieying process extends to the necroeconomic enterprises.

Auth.

7.A3.37. The possibilities of compensation of depositors suffered in the 90s of the 20th century in Georgia against the background of overcoming the world economic crisis. /M. Tsiskarishvili/. Ekonomisti. – 2010. - #2. – pp. 10-14. – geo.; abs. eng.

After the break-up of the Soviet Union, all the post-Soviet republics had to go through a serious financial and economic crisis which was raging for several years. Hyperinflation processes destroyed all the deposits in the state commercial banks that had been collected by several generations. As a result, 90% of the population grew poor. Against the background of activities for overcoming the 2008/2009 World Economic Crisis, the only effective and tested way was to help the population to overcome the crisis by support by the State through establishing corresponding funds. Therefore, in order to finally do away with the outcomes of the economic crisis it is necessary that a national compensation fund be set up, whose accumulated sums would be paid out to the damaged depositors as indemnity.

Auth.

7.A3.38. Social risks in contemporary Georgia. /Ts. Antadze/. Ekonomisti. – 2010. - #2. – pp. 15-34. – geo.; abs. eng.

The changes taken place in the 90s of the 20th century in Georgia significantly exacerbated social risks existing in society. Under conditions of their disregard by the State, the degree of risks tends to increase. At the present stage, the following social risks can be ascribed as the principal ones: a reduction in the population size (demographic demise); the acceleration of the rates of demographic aging and the sharp growth of the size of population above 65; the worsening of population's health condition and the lack of an effective system for financing public health service; a restricted access to quality education; the growth of unemployment and low wages; the worsening of living standards; an increase in the population's property differentiation (polarization) and antagonization of the public social structure; the indefensibility of labour rights and discrimination of employees; the lack of an effective system provision of pensions and social welfare; a tendency for devaluation of national and moral values (the spiritual and moral crisis. The above-mentioned risks and challenges necessitate a timely reaction from the public and the authorities. First of all, it is necessary to really assess the risks and look into the reasons that cause dangers. Following from the specificities of separate problems, the State can use different strategies, but any model of strategies should serve to eradicate or moderate the reasons that generate risks. Failing this, the effect will be temporal and the risks will continue to exist.

Auth.

7.A3.39. Peculiarities of Georgian balance of trade. /N. Tsomaia/. Ekonomisti. – 2010. - #2. – pp. 35-37. – geo.; abs. eng.

The balance of trade is one of the important indicators of a country's economic security. To achieve the positive balance of trade, Georgia must orientate on organic and high-tech agricultural production and the development of such traditional spheres as quality alcoholic and non-alcoholic beverages, mineral and spring waters.

Auth.

7.A3.40. Formalization of risk management process in a firm. /N. Lazviashvili/. Ekonomisti. – 2010. - #2. – pp. 38-45. – geo.; abs. eng.

Modern business is very risky. The economic globalization has further increased the probability of risks. Therefore, the management of risks has become very important and a special discipline "risk management" has been established. Risk management includes balanced, consecutive actions to display, measure and manage events which cause losses and financial difficulties. The effective procedure for risk management enables the leadership of a company to forecast risks and make reasonable decisions for managing them. "Risk management" is connected to such concepts as restraint and danger. By knowing risk management, we not only avoid a danger but really improve our lives. Only effective risk management will help.

Auth.

7.A3.41. Small business in Georgia: problems and perspectives. /N. Tsomaia/. Ekonomisti. – 2010. - #2. – pp. 46-49. – geo.; abs. eng.

The cardinal problems of small business in Georgia include: insufficient attention on the part of the State, practical non-realization of the anti-monopoly legislation, the crediting and financing, etc. The development of small business in Georgia requires the application of such forms of crediting as franchising and leasing, also government subsidies.

Auth.

7.A3.42. Water business in Georgia. /G. Maisuradze/. Ekonomisti. – 2010. - #2. – pp. 50-53. – geo.; abs. eng.

Together with other natural resources, potable water of Georgia represents one of the main productive forces (factor), which can play a leading role in the economy of the republic. Special attention should be paid to the implementation of a new program “Water is National Wealth” and the attraction of investments. The article focuses on the importance of export and future development goals of this promising sector.

Auth.

7.A3.43. Issues of small and medium enerprises development in Armenia. /A. Matevosyan/. Ekonomisti. – 2010. - #2. – pp. 54-59. – rus.; abs. eng.

Small and medium enterprises (SMEs) are the basis of the economic and social stability of all the states. It is necessary to establish a principal development and support system in the SME sphere for realizing the national policy and strategy. It should include both the government structures and international commercial organizations. Such a political system and the implementation mechanisms in the sphere of SMEs are not effective in Armenia. The available international experience indicates the necessity of establishment of such a system and mechanisms.

Auth.

7.A3.44. The investment evaluation-based approach to financial stabilization. /A. Matevosyan/. Ekonomisti. – 2010. - #2. – pp. 60-66. – eng.; abs. rus., eng.

For the purpose of the financial position control, commercial enterprises establish secondary reserves for transactions on financial markets. In the process of financial management process, the primary direction is acquired by new approaches and mechanisms of financial stabilization of the enterprise. The developed and proposed methodology allows selecting of effective investment projects.

Auth.

7.A3.45. Theoretical and practical problems of the competition law and policy under modern conditions. /N. Hajiev, Z. Galilov/. Ekonomisti. – 2010. - #2. – pp. 60-66. – eng.; abs. geo., eng.

The principal tasks of the competition policy are considered. Competition forces firms to become more efficient and to offer customers a wide choice of products and services at lower prices. The article also refers to a certain tension between the law and economy. Whatever the tasks of competition policy, the issue of their achievement is still to be solved.

Auth.

7.A3.46. The ways of a real sector devolopment in Georgian regions. /V. Burduli/. Ekonomisti. – 2010. - #4. – pp. 12-18. – geo.; abs. eng.

The article shows the expediency of working out of a strategy for development of basic sectors of economy in the context of regions. A number of provisions to be reflected in such a strategy are shown and described, to wit: the determination of ways of renovation of technologies; the determination of the most expedient institutional forms of the organization of production in towns and country; the ways of distribution of expediency forms of foreign capital in the country; the creation of a favorable investment climate in co-ordination with local authorities, central authorities, associations of entrepreneurs, and trade unions; the determination of supplementary measures for stimulation of medium and small business; the foundation of special economic zones in some regions.

Auth.

7.A3.47. The post-Soviet social-state system and its specific features. /Al. Kuratashvili/. Ekonomisti. – 2010. - #4. – pp. 19-23. – rus.; abs. geo, eng.

The essence of the post-Soviet social-state system and its specific features are considered. The ugly nature of the post-Soviet social-state system and the necessity of its radical change in the interest of the people are substantiated.

Auth.

7.A3.48. Deregulation of economy – as a component of the government regulation system. /An. Kuratashvili/. Ekonomisti. – 2010. - #4. – pp. 24-27. – rus.; abs. eng.

Problems of the government regulation of economy are considered. At the same time, the economic deregulation is understood and substantiated by the author as a specific method of government regulation, since the government economic regulation is also governed by the State.

Auth.

7.A3.49. Problems of science and education economy in Georgia. /R. Sarchimelia, L. Charekishvili/. Ekonomisti. – 2010. - #4. – pp. 35-43. – geo.; abs. eng.

There is a view on inevitability of uniting science, education and scientific-technological progress (STP) in knowledge economy. But there is also one notice: further development of STP in Georgia is now impossible due to the lack of needed funds. Since the 21st century science is partly united with education in post-soviet Georgia. In 1995-2005 the portion of humanitarian scientists in the structure of all Georgian scientists exceeded the share of scientists in the technical field. The number of scientific workers has declined

dramatically in recent years. As revealing potential in this field has become increasingly difficult and fewer funds are assigned by the State, we are facing a massive brain-drain. Other problems to mention are the closure of many educational institutions, low salaries, etc. Secondary and higher educational institutions are characterized. For comparison, deep differentiation of the American educational system is given. One of the requisites for high educational level in Georgia is the provision of right personnel at both the management and pedagogic levels. The main aim is to approach international standards. Georgian entrepreneurs have no funds for financing scientific researches. The formation of a self-organizing economic system for science and education is seen as a hope for brighter future. This therefore is connected with the STP, the regulator of which is science-based economy.

Auth.

7.A3.50. The role of internal audit and control in the sector development (a case of health protection in Georgia). /Ts. Benashvili/. Ekonomisti. – 2010. - #4. – pp. 44-47. – geo.; abs. eng.
It is generally recognized that if health systems throughout the world vary widely in their design, content, management and performance, they share the same core goals of *good health, responsiveness to people's expectations and fair financing* - one of the main topics for the WHO European Ministerial Conference on Health Systems: "Health Systems: Health and Wealth" conducted in Tallinn in June 2008. The charter adopted at this conference ("Tallinn Charter") commits the member states to: promote transparency and be accountable for health system performance to achieve measurable results. To achieve these objectives, it is necessary that a system of internal audit be developed.

Auth.

7.A3.51. Parameters and state regulation of economy. /E. Mekantsishvili/. Ekonomisti. – 2010. - #4. – pp. 48-52. – geo.; abs. eng.
The article provides parameters and the necessity of state regulation of economy. There are shown main directions of state regulation. The fact is that the state must fulfill some requirement while regulating the economy, which is necessary under free competition. It must create the bases for the development of enterprising, one of the important conditions of which is forming fiscal policy for countries with transitional economy. The State must outline the main principles, in particular allocate credits to stimulate enterprise, and work out relevant legislation to mark off the rights and obligations of the government and private sectors.

Auth.

4. Education

7.A4.1. What should be scientific competition? /G. Beria/. Science and Technologies. – 2010. - #4-6. – pp. 3-6. – geo., abs.: eng., rus.
The article proposes alternative views of the author concerning scientific competition. In particular: the scientific competition should be as much public as possible; only patentable components of a project proposal should be accepted. The main characters of a competition are the author, the opponent and the arbitrator. Remuneration of their works should be through salaries, grants, fees and awards according to their contribution to the competition. Science does not produce on masse, marketable goods. Scientific competition is the arena of a single combat of hypotheses for solving the yet unsolved problems. The expert arbitrator is the necessary person in production but in science it can be only a passive adviser.

Auth.

7.A4.2. English language teaching concept. /I. Gachechiladze/. Science and Life. - 2010 - №1. - pp. 128-132. - eng.; abs.: geo., rus., eng.
The article presents main directions in the methods of teaching the English language, their strengths and weaknesses, also the problems accompanying the teaching process and different methods of their adequate solution. The author also expresses own point of view concerning the improvement of the English language teaching.

Auth.

7.A4.3. Psychological bases of pedagogical relations. /N. Saginashvili/. Science and Life. - 2010 - №1. - pp. 173-177. - geo.; abs.: geo., rus., eng.
The pedagogical influence on a pupil is realized on the basis of a certain relationship. The style of pedagogical relations determines the results of educational-upbringing activities of any type. There are known several types of pedagogical relations, but only three ones are outlined by Georgian scientists: democratic (co-operative), authoritarian (imperative), and liberal. Two sharply different styles – the democratic and the authoritarian are considered by the scholars as the most effective ones. The style of liberal relations is less used, for it is considered harmful to pedagogical activities. Certain obstacles are often found in pedagogical relations, such, for example, as the psychological and communicative aspects. The means of pedagogical relations are divided into two groups – the verbal (lexical) and nonverbal (gesture, facial expression, etc).

Auth.

7.A4.4. Management of knowledge. /I. Chkhaidze/. Science and Life. - 2010 - №2. - pp. 39-43. - geo.; abs.: geo., rus., eng.
The positive and negative characteristics of the knowledge classification types - 'fundamental knowledge maintenance' and 'innovative knowledge' are considered. The first type of knowledge is characterized as enabling a person 'to take part in a game' and ensuring significant competitiveness of a company, on the one hand, as well as creating a significant barrier to the development in the company at the same level or the same knowledge degree, on the other hand. The second knowledge classification type, in contrast to the first type, enables companies to change "the game rules" and attain leadership in their sphere of activities. The innovative knowledge realization is said to be impossible without the fundamental knowledge maintenance in the specific branch. The above requires that the knowledge classification types be practically introduced in companies for handling the arising problems and attainment of necessary competitiveness and leadership.
Auth.

7.A4.5. Shaft-laboratory of Georgian Technical University - a unique form of professional training. /D. Rogava, U. Kavtiashvili/. Mining Journal. – 2009. – #2(23). – pp. 81-82. – geo.; abs.: rus., eng.
For about two decades a new, effective form of training for mining engineers and geologists has been used in Georgian Technical University. This is a shaft-laboratory located under the academic building of mining and geological faculty. All the necessary facilities are provided there to carry out a full range of subterranean works, for modeling industrial and practical situations. A group of authors – makers of this shaft-laboratory - was given the Georgian State award (1993). The fact of conducting educational processes in this shaft-laboratory has provoked a great interest on the part of higher educational faculty in foreign countries.
Auth.

7.A4.6. Typological peculiarities of an educational system. /K. Ramishvili, M. Bairamov/. Newsletters of Academy of Education Science of Georgia. – 2010. - # 2(17). – pp. 32-34. – rus., abs.: geo., eng.
Analysis of different scientific directions in the estimation of an educational system enabled the authors to represent the system of educational institution as a complex psychological–pedagogical activity, the core of which is the pedagogical reality. The article analyzes typological peculiarities of the educational system.
Auth.

7.A4.7. Some theories of educational management. /Z. Chkhikvadze, L. Tsikaridze, M. Zarkhozashvili/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 408-416. - geo.; abs.: geo., eng.
Educational management is a field of study and practice concerned with the operation of educational organizations. Educational management has to be centrally concerned with the purpose or aims of education. These purposes or goals provide the crucial sense of direction to underpin the management of educational institutions. Unless this link between purpose and management is clear and close, there is a danger of "managerialism - a stress on procedures at the expense of educational purpose and values". "Management possesses no super-ordinate goals or values of its own. The pursuit of efficiency may be the mission statement of management – but this is efficiency in the achievement of objectives which others define".
Auth.

7.A4.8. On the conformity and neccesity of improving current educational programs, specialities and academic degrees of higher education in Georgia. /A. Giorgobiani. M. Giorgobiani T. Melqoshvili/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 451-457. - geo.; abs.: geo., eng.
In the present research, based on the appropriate critical analysis, the authors tried to show nuances of a newly created classifier of granting of academic degrees (qualifications) of the Faculty of Economics and Business, Bachelor's, Master's and PhD programs specialties, in TSU and of a descriptor of higher education qualifications according to the National Framework of Criteria, and to harmonize them with the principles of the proposed Doctrine (Concept) of Dialectic Unity of Science and Scientific Research Differentiation and Integration for ensuring comparability of their conformity and facilitating the qualification recognition process at an international level.
Auth.

A5. Informatics/Computer Science

7.A5.1. On the applicability of information technology to the estimation of the nonstationary pulse transitive matrix in controlled multivariate dynamic processes. /G.Odisharia, N.Kukhalashvili, K.Kasoshvili, D.Odisharia/. GEN. – 2010. - #1. - pp. 10-12. - eng.; abs.: rus.
The work deals with the investigation of the main properties of the estimation of the non-stationary pulse transitive matrix corresponding to non-stationary differential models of controlled multivariate processes. Earlier, similar investigations were performed for stationary differential models.

Auth.

7.A5.2. The results of estimation of non-stationary parametric matrix in controlled multivariate dynamic processes by using information technology. /G.Odisharia, N.Kukhalashvili, K.Kasoshvili, D. Odisharia/. GEN. – 2010. - #1. - pp. 13-15. - eng.; abs.: rus.
The article deals with the investigation of the main properties of the algorithm estimating the parametric functions matrix corresponding to non-stationary differential models of processes for the case when the parameter factors of control vector components are taken arbitrarily.

Auth.

7.A5.3. Analysis of service quality in data transfer networks. /M. Kiknadze, E. Gvaramia, I. Davitashvili/. Science and Technologies. – 2010. - #4-6. – pp. 14-16. – geo., abs.: eng., rus.
The article describes the properties of data transmission in a computer network as required by customers. Presented are the main parameters used as indicators of service quality of some implementation models of service level.

Auth.

7.A5.4. On cryptographic methods of information protection in the data transmission nets. /M. Kiknadze, E. Gvaramia/. Science and Technologies. – 2010. - #7-9. – pp. 3-7. – geo., abs.: eng., rus.
The article considers the cryptographic algorithms of the information protection in the data transmission nets. The classification of such algorithms is given and the advantages of the data ciphering with open key are indicated. The questions of electronic signature and the requirement to be met by a reliable cryptographic system are discussed and formulated.

Auth.

7.A5.5. Information revolutions. /V. Gogichaishvili/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 463-466. - geo.; abs.: geo., eng.
High rates of the development of science and technologies and their implementation brought us to the natural processes of scientific technical revolution. Some revolutions – transformation of public relations into the sphere of information processing and informational technologies have taken place in the history of the development of civilization. The revolution has already begun but it does not take place where scientists, politicians, corporate chiefs and information industry are searching for it, in general. This is not a revolution in devices, technologies, software or in the data collection and transmission speed. This is a revolution of concepts.

Auth.

7.A5.6. Priority M/G/1 system with some restrictions. /R. Kakubava, D. Gulua, G. Pipia, V. Didmanidze/. Transactions of Technical University of Georgia. - 2010. - #1(475). – pp. 81-84. – geo.; res.: geo., eng., rus.
The work deals with a single-channel queuing system that can actually be any technical system with a non-deterministic load. In consequence of some usual probabilistic considerations a mathematical model for such systems is constructed. The main principles of simulation are demonstrated when two simplest flows enter the system. A method for its generalization is proposed.

Auth.

7.A5.7. Simulation of some services consumer behavior. /R. Kakubava, R. Kutateladze, G. Pipia, V. Didmanidze/. Transactions of Technical University of Georgia. - 2010. - #1(475). – pp. 85-88. – rus.; res.: geo., eng., rus.
The article considers some important topics of utility structures. Namely, the decision-making on a choice of the type of service by the consumer is identical to the choice of a concrete point in the services space. Some initial provisions are postulated, which are widely adopted in the utility theory. The consumer behavior is simulated and investigated. An illustrative example is considered and explicit numerical expressions are derived.

Auth.

7.A5.8. Georgian grid's optimum daily performance algorithm. /R. Samkharadze/. Transactions of Technical University of Georgia. - 2010. - #1(475). – pp. 89-94. – rus.; res.: geo., eng., rus.
An optimum daily performance algorithm of the Georgian grid is given. The algorithm determines the TPP's optimum daily performance and the fuel consumption minimization criterion consisting of two components: (i)

consumption of fuel caused by power alterations at the TPP during adjacent hours and (ii) consumption of fuel caused by changes in the composition of power units at the TPP during adjacent hours. On the basis of multiple experiments the type of penalty function and the numerical values of its elements are established, under conditions of which the minimal fuel consumption is achieved. The algorithm has been realized as a computational component of the expert system constructed for power management of the Georgian grid.

Auth.

7.A5.9. Practical determination of the volume of power generation using the least−squares method. /G. Macharashvili/. Transactions of Technical University of Georgia. - 2010. - #3(477). – pp. 66-71. – geo.; res.: geo., eng., rus.

The science and engineering advances make it possible to improve the power management process, which in the first turn implies the perfection of problem solving techniques, where simulation and mathematical methods are used. Their application will result in the obtaining of many alternate solutions and the possibility of selecting the best one on their basis.

Auth.

7.A5.10. Simulation and analysis of the M/M/4+3 system. /G. Amilakhvari, D. Gulua, G. Pipia/. Transactions of Technical University of Georgia. - 2011. - #1(479). – pp. 46-50. – rus; res.: geo., eng., rus.

The article deals with the study of a stand-by technical system with two operation types (replacement and recovery). The recovery and replacement period is made of exponentially distributed random variables. For final probabilities of the state of system, by means of the mnemonic circuit, a linear algebraic system of equations is written down. The economic efficiency of the system functioning is determined.

Auth.

7.A5.11. The computer-imaging-based analysis of a dynamic cardiac rate system. /I. Chkheidze, M. Berishvili, L. Tokadze/. Transactions of Technical University of Georgia. - 2011. - #1(479). – pp. 51-54. – geo.; res.: geo., eng., rus.

The graphic research methods of a dynamic cardiac rate system, based on the determined chaos theory are considered. The obtained results graphically demonstrate a difference in the change of indicators in healthy and sick patients. The research of cardiac rate dynamics has shown that application of the proposed methods allows carrying out an analysis of the properties of a bio-medical system around the MathCAD program. The traced character of the employed algorithms significantly simplifies the comprehension of the peculiarity of their dynamic behavior and will assist doctors in making a reliable diagnosis.

Auth.

7.A5.12. On the Laplace lacunary series on the sphere. /S. Topuria, V. Khocholava/. Transactions of Technical University of Georgia. - 2011. - #1(479). – pp. 55-60. – rus; res.: geo., eng., rus.

The question of convergence of the Laplace lacunary series on a sphere is studied. The series are found to significantly differ in terms of convergence from the ordinary Laplace series (without lacunas). In particular, the work states that if the Laplace lacunary series is the Fourier series, it will converge almost everywhere, whereas for ordinary Fourier-Laplace series their Cesarean mean may diverge almost everywhere for a critical index.

Auth.

7.A5.13. Smart system of training process quality evaluation. /I. Zedginidze, T. Menabde/. Transactions of Technical University of Georgia. - 2011. - #1(479). – pp. 61-66. – geo.; res.: geo., eng., rus.

Methods of analysis of the training process quality are given. In particular, compilation of X, S, NP controlling maps makes it possible to timely identify and correct the so-called “weak link”, to change the teaching material delivery sequence, its content, etc. The presented analysis, made on the basis of the above, enables to better evaluate the performance of the faculty, chairs and the dean’s office.

Auth.

A6. Other Social Sciences

7.A6.1. On the issues of bibliometric rating in science. /V. Tevzadze, I. Iordanishvili, Z. Charbadze, I. Iremashvili, K. Iordanishvili, E. Khosroshvili/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 104-113. – geo., abs.: geo., eng., rus.

The paper reviews the assessment methods concerning the existing rating of scientists, scientific institutes and scientific journals, which made possible to reveal shortcomings of these methods. The authors propose updated and comprehensive methods of rating of the Georgian science-based products.

Auth.

B. NATURAL AND EXACT SCIENCES

B1. Mathematics. Mechanics. Physics. Cybernetics

7.B1.1. Simplified method for derivation of the dispersion equations for the multilayer magnetodielectric-filled rectangular waveguide. /S.Gdzelishvili/. GEN. – 2009. - #2. - pp. 17-25.; eng.; abs.: rus.

A simplified method for derivation of dispersion equations for finding the propagation constants of longitudinal modes in the rectangular waveguide with longitudinal homogeneous *N*-layer isotropic magnetodielectric filling is presented. The analysis is based on the use of the transfer matrix of plane layer (TMPL) associating the field strength values of eigenmodes of the structure at flat boundaries of the layer. The efficiency of the method is due to the unified representation of the dispersion equation. This representation includes a product of *N* transfer matrices (TMPL), which are unimodular. A recurrent form of the representation of the dispersion equation is given too.

Auth.

7.B1.2. On the electromagnetic compatibility of a dipole antenna. /G. Kevanishvili, I. Kevanishvili, Z. Sikmashvili, K. Kotetishvili, V. Meladze, A.Asanidze, G.Chikhladze/. GEN. – 2009. - #2. - pp. 7-16.; eng.; abs.: rus.

A new method for investigation of electromagnetic compatibility (EC) and noise immunity (NI) of the active dipole is presented. At the first stage, a new, correct solution of Hallen's integral equation relative to the axial current of the dipole is given. It is shown that, besides the sinusoidal term caused by the action of e.m.f., applied to the center of the dipole, it contains other, new terms created by the interference of fields radiated by separate arms of the dipole. New formula characterizing the radiation pattern of the dipole is concluded; so-called compatibility function (CF) is introduced, while its analysis provides rather satisfactory characterizing and description of EMC and NI of the dipole. Great number of numerous data is presented, proving the effectiveness of suggested method of estimation and improvement of EMC of the dipole.

Auth.

7.B1.3. Cryogenic condensation pump with joined flange from below. /G. Dgebuadze, M. Mumladze, T. Sordia, L. Tsakadze, V. Chanturidze/. Science and Technologies. – 2009. - #10-12. – pp. 8-12. – geo., abs.: eng., rus.

The article proposes a cryogenic pump where helium is used as the cooling agent, which allows the receipt of super high and super clean vacuum from the atmospheric pressure with the pumping speed of up to 10^{-11} Pa with speed ($\geq$1000 m^3/s). The cryogenic pump design and the values of the absorbed heat streams by its constructive elements of different modification are given.

Auth.

7.B1.4. Bio-field and radiating systems. /L. Kadagishvili/. Science and Technologies. – 2010. - #4-6. – pp. 7-13. – geo., abs.: eng., rus.

The article presents in measurable functions the results obtained by heuristic research of psychic processes and their analysis. In the case of time deficit while revealing perceived information, the stream of consciousness receives a wave-corpuscle image, meaning that the process is a quantum phenomenon. The analysis shows us a mutually filling process of conscious and unconscious processes, also the mutual twist - rotation towards each other. In nature, everything which is formed by rotation creates a statistical torsion field. The process quanta are elementary particles which are transmitters of information. The unconscious serves as vacuum before becoming conscious in the psyche. Thus, there appear the two simplest notions: a torsion field and vacuum. The vacuum is a potential state of all kinds. If we follow this logic for quantum processes, there will be as well an independent parameter - spin. The quantum analogue of the parameter spin is an angular rotation momentum which gives birth to its field, called as a torsion field. The torsion fields will be created only in the objects having the spin, and this is a bio-field.

Auth.

7.B1.5. Definition of parameters of kinetic equations of creep and rupture during large deformations. /O. Kikvidze, P. Kipiani, A. Chumbadze, L. Kikvidze/. Science and Technologies. – 2010. - #4-6. – pp. 47-51. – geo., abs.: eng., rus.

The article considers the worked out techniques for determining the characteristic parameters of creep and rupture kinetic equations. Formulas for calculation of constants are obtained and their values for concrete cases are found.

Auth.

7.B1.6. Theoretical research of estimation parametres of passability of a wheel on a deformable ground. /A. Geguchadze, D. Topuria, R. Chabukiani/. Science and Technologies. – 2010. - #7-9. – pp. 57-61. – geo., abs.: eng., rus.

The authors propose the methods of theoretical and practical definition of passability of wheel cars on a deformable ground. The physical essence of passability on a deformable surface is defined and the method of measurement on stand and the formula are developed for the passability calculation by the specified method. Also, formulas allowing for theoretical calculation of the pulling-coupling properties of a wheel on a deformable ground are analytically developed.

Auth.

7.B1.7. Circular flow and the issue of overcoming the Carnot cycle efficiency. /A. Aptsiauri/. Georgian Scientific News. – 2010. - #1(5). – pp. 7-14. – rus., abs.: geo., eng., rus.
Analysis of the Kueet flow of gas by the entropy technique with a focus on energy assessment of the flow is demonstrated. Accordingly, the Kueet flow is considered as a thermal pump and it is demonstrated that the efficiency of such a pump exceeds the Carnot reversible cycle efficiency when the Prandtl number verges towards zero. The same flow is shown to be the basis for making a paradoxical thermal engine and it is grounded that the basic obstacle for realization of a perpetuum mobile of the second kind is the physical resistance of real bodies rather than the temperature equilibrium of the environment.

Auth.

7.B1.8. The Riemann boundary value problem for analytic functions in the frame of Grand *Lp*) spaces. /V. Kokilashvili/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 5-7. – eng.; abs.: geo., eng.
We solve the Riemann boundary value problem for analytic functions in the class of Cauchy-type integrals with the density in the grand Lebesgue *Lp*)(Γ) spaces. We consider the case when a coefficient in boundary condition is everywhere non-vanishing continuous function and the right side function belongs to the same *Lp*) space. The solvability conditions are established and the explicit formulas for solutions are given.

Auth.

7.B1.9. On the regression estimation in a Hilbert space. /E. Nadaraya, P. Babilua, G. Sokhadze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 8-11. – eng.; abs.: geo., eng.
The problem of estimation of a regression curve in an infinite dimensional space is considered. Such problems arise in the statistics of random processes. Observation data in such processes is a pair whose one component is an element of an infinite dimensional space. It is shown that the finite dimensional projections of observations and the regression curve estimators constructed on their basis give an approximation of a regression function in the initial space. The method of infinite dimensional analysis and in particular the notion of the logarithmic gradient of a distribution function are used.

Auth.

7.B1.10. On the notion of generalized spline for a sequence of problem elements sets. /D. Ugulava, D. Zarnadze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 12-16. – eng.; abs.: geo., eng.
In the present paper the notion of spline is generalized for the case where not one set of problem elements, but a decreasing sequence of problem elements sets on a linear space is given. The generalized interpolation spline realizes a minimum not only of the metric, but also of the corresponding Minkowski functional. The necessary and sufficient condition for the existence of generalized spline for arbitrary non-adaptive information of cardinality 1 is given.

Auth.

7.B1.11. The lattice of fully invariant submodules of a reduced cotorsion *p*-adic module. /T. Kemoklidze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 17-21. – eng.; abs.: geo., eng.

The paper considers the lattice of fully invariant submodules of a reduced cotorsion *p*-adic module $T^{\bullet}\oplus\mathbf{C}$, where $T^{\bullet}$ is a countable direct sum of torsion-complete *p*-groups, and C is a torsion-free, algebraically compact group. It is shown that this lattice is isomorphic to the lattice of filters of a semi-lattice made up of infinite matrices and indicators.

Auth.

7.B1.12. Maltsev bases and triangular representations of tensor products of Abelian groups. /M. Amaglobeli, V. Remeslennikov/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 22-28. – eng.; abs.: geo., eng.
The paper is dedicated to the construction of Maltsev bases and triangular representations of tensor products of Abelian groups.

Auth.

7.B1.13. Basic advantages of integrated circuits made on the structure of "silicon on sapphire"(SOS). /R. Kazarov, R. Chikovani, G. Maglakelidze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 29-33. – eng.; abs.: geo., eng.

Development of an integrated circuit using silicon on sapphire (SOS) structures, namely, constant memory device, fulfilled on the basis of vertical diode structure, is described. An optimal technological route of creation of a diode matrix on SOS with account of obtaining isolated “islets” of silicon parameters of matrix is introduced. Complete technological cycle of diode integrated circuits on SOS is given. The obtained diode matrix was used in constant memory blocks of radioelectron devices for space and submarine apparatus. Interesting assumptions about the prospective of exploitation of SOS structures in nanoelectronics in order to create solid state optoelectronic devices using nanosilicon in SOS structures are reported.

Auth.

7.B1.14. Investigation of the role of negatively charged impurity centers in formation of inverse distribution of photoelectrons; the kinetics equation and formation of the inverse distribution function. /E. Khizanishvili, Z. Kachlishvili, M. Khizanishvili, M. Gigauri/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 34-37. – eng.; abs.: geo., eng.

The active medium with the inverse charge carrier population is known to form the basis of up-to-date semiconductor masers and lasers. This population can be created by various actions, including electron generation and heating towards the conductivity region by means of electromagnetic radiation (photoheating). The objective of our study was to find the conditions for formation of regions of hot photoelectron distribution when their lifetime is controlled by trapping either negatively or positively charged impurity centers for different energy relaxation mechanisms, both quasi-elastic and strongly inelastic.

Auth.

7.B1.15. Influence of arsenic on the physical-mechanical characteristics of monocrystalline $Si_{99.97}Ge_{0.03}$: as solid solution. /I. Kurashvili, E. Sanaia, G. Bokuchava, I. Baratashvili, G. Darsavelidze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 38-41. – eng.; abs.: geo., eng.

Physical-mechanical characteristics amplitude dependence of arsenic-doped monocrystalline $Si_{99.97}Ge_{0.03}$: As solid solution in the temperature range of 20-700^{0}C were investigated. The reasons of the variations of physical-mechanical characteristics, caused by doping, thermal treatment and high amplitude cyclic deformation were analyzed.

Auth.

7.B1.16. On one nonlinear dynamic iterative method of structure analysis. /G. Gabrichidze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 70-73. – eng.; abs.: geo., eng.

The paper discusses one method of structure analysis given in European Standard EC-8, part 3, the essence of which can be formulated as follows: the response spectrum analysis of structure to full seismic action without the reduction coefficient is conducted, and verification of structure elements in the field of the obtained displacements is carried out to see how much they comply with this field of displacements. We propose to continue this procedure by way of iteration, the aim of which is to make more accurate the obtained solution. The paper presents the description of this iteration process and its demonstration with simple example is given. The method can be extended to tasks of dynamics when time participates in explicit form.0000

Auth.

7.B1.17. Low concentration of the current carriers in doped IV-VI semiconductors at "negative" pressure. /O. Davarashvili, L. Bychkova, M. Enukashvili, M. Dzagania/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #4. – pp. 484-487. – rus.; abs.: geo., eng.

It is shown that such impurities as, for example, In and Cr essentially influence the elastic properties, width of the forbidden gap and concentration of the current carriers in IV-VI semiconductors' layers. A degree of such influence depends on a mismatch of a layer with a substrate and its orientation. The conditions corresponding to "negative" pressures, at which the width of the forbidden gap increases, and stabilized Fermi level connected with an impurity in its depth, are realized. For the first time, the algorithm for calculation of the energy position of an impurity level is developed for the strained semiconductor. It is also shown that the concentration of current carriers under such conditions is considerably lower and it is connected with the change of the energy spectrum of the current carriers rather than with compensation.

Auth.

7.B1.18. Analysis of the results of experimental and theoretical study of a hydraulic hammer resulting from liquid flow separation from the stop valve of the pressure line. /L. Makharadze, A. Sharikadze/. Mining Journal. – 2009. – #2(23). – pp. 48-55. – geo.; abs.: rus., eng.

The article gives an analysis of the results of theoretical and experimental study of a hydraulic shock, originating from the separation of liquid flow (water, hydromixture) from the stop valve of a pressure line upon its rapid closure; compared are the basic parameters characteristic of the process, in particular, speeds of the separated flow in direct and reverse directions, the vacuum zone pressure (dilution) formed as a result of the separated stream, etc. The convergence of the parameters has been determined, which is of great importance for their engineering-practical calculation within the permissible limits.

Auth.

7.B1.19. Computer program of calculating operational and construction parameters and investigation of effectiveness of reliable means for pressure systems protection from water hammers. /L. Makharadze, K. Khatiashvili, A. Sharikadze/. Mining Journal. – 2009. – #2(23). – pp. 55-62. – eng.; abs.: geo., eng.

The results of theoretical and experimental researches of the effective and reliable means of protecting pressure systems from water hammers are described. The working parts of the water hammer alleviator are made of elastic elements in the form of: toruses, spherical spheres, hoses made of elastometers and filled with air. In the theoretical part the generalized algorithm is designed, allowing to consider all hydrodynamic parameters during a non-steady process; working and construction parameters of a water hammer alleviator; physical-mechanical performances: of the air, as the basic damping element; the material from which pipelines are made; the material from which elastic element of water hammer alleviator are made. This algorithm is the basis of developing any computer program for computing these water hammer alleviators. The legitimacy of the implemented theoretical analysis, the gained mathematical calculated dependences and the computer program accordingly is validated by experience on a semi-industrial experimental laboratory stand, and the efficiency and reliability of water hammer alleviator - on large-scale hydrotransport systems.

Auth.

7.B1.20. The analysis of work of three phase rectifiers on the power supply of a plasma arc with the rectangular characteristic. /D. Gelenidze, G. Gogia, Z. Batkhadze, M. Gelenidze/. Mining Journal. – 2009. – #2(23). – PP. 63-67. – Eng.; abs.: Geo., Rus.

The new principle of reception of the rectangular characteristic of the power supply is described in this article. The analysis of work process of a three-phase rectifier on the power supply with the rectangular characteristic is carried out and design specifications of the rectifier are defined, namely: sizes of return pressure on diodes, currents in diodes, linear and phase pressure of a secondary winding of the power transformer, linear and phase pressure of a primary winding of the power transformer, linear and phase currents of a secondary winding of the power transformer both linear and phase currents of a primary winding of the power transformer are defined. It is shown, that the power supply with the rectangular characteristic provides stable work of a plasma arc.

Auth.

7.B1.21. Computer modeling of start-up process of a cableway drive. /B. Geleishvili, G. Javakhishvili/. Mining Journal. – 2009. – #2(23). – pp. 69-72. – geo.; abs.: rus., eng.

Problems of matching of arguments, adjustment and the assaying of an automatic control system of a drive of a cableway after the example of Chiatura passenger cableway 'Center-Naguti' are surveyed. As a result of development of a computer model of the existing system, it is established that the maximum acceleration of the drive upon start-up exceeds the safety operation standards. For elimination of the problem, a speed limit device is additionally provided in the automatic control system. The numerical experiment was carried out with the aid of a software package of Matlab and Simulink.

Auth.

7.B1.22. Hot shock wave synthesis and treatment of artificial diamonds. /E. Chagelishvili, N. Chikhradze, A. Peikrishvili, M. Tsiklauri, B. Godibadze/. Mining Journal. – 2010. – #1(24). – pp. 60-64. – rus.; abs.: geo., eng.

The phase transformation of graphite into diamond is investigated in the Cu-graphite mixtures after a two-stage hot shock wave treatment. The Cu-graphite bland powder was initially was placed into a cylindrical container and compressed at 10GPa. The obtained billets were cut onto cylindrical samples with dimensions 500x500mm and re-loaded under hot conditions by plane shock waves through the aluminum flying plate. As the investigation showed, after the treatment/loading of preliminary consolidated Cu-graphite blend powders under hot conditions, the graphite transforms into diamond. Depending on the temperature of targets, the loading conditions and the deepness of propagation of shock wave in the target, the structure and morphology of the transformed diamonds change. The above-mentioned and other features of the graphite-diamond phase transformation under dependent or loading conditions will be described too.

Auth.

7.B1.23. Fabrication of WC-NiAl composites by hot explosive consolidation: a structure/property relationship investigation. /A. Peikrishvili, L. Japaridze, L. Keskes, E. Chagelishvili, B. Godibadze/. Mining Journal. – 2010. – #1(24). – pp. 68-73. – geo.; abs.: rus., eng.

Wc-NiAl powder mixtures were formed into cylindrical rods and tubes using a hot explosive consolidation process. Hot explosive consolidation was also applied to form WC-NiAl coatings on cylindrical steel surfaces as well. The WC-NiAl composite consisted of WC particles dispersed in a Ni-Al matrix, made from a Ni-clad Al precursor powder, wherein each Al particle is coated by a Ni layer. The consolidation temperature was varied from room temperature to 800°C; the shock loading intensity was as high as 10 GPa. The

investigation showed that the combination of high temperatures and explosive compression was beneficial to the consolidation of the WC-NiAl composites, resulting in near theoretical densities, high hardness values, and the formation of transient layer between the sample and the steel container's wall. The structure and property of the samples obtained, and the formation of the transient layer depended on the shock loading conditions and the phase content of precursor powders. The above mentioned as well as other features of the structure/property relationship of the consolidated WC-NiAl samples as a function of the loading conditions (experimental set-up, intensity of loading, or preloading temperature) are discussed.

Auth.

7.B1.24. The calculation of a pneumohydraulic storage battery. /L. Makharadze, A. Sharikadze/. Mining Journal. – 2010. – #1(24). – pp. 74-82. – geo.; abs.: rus., eng.
Considered is a procedure for calculation of a pneumohydraulic storage battery, to the upper part (in immediate proximity of cover) of which additional elastic volumes filled with air - prepared from the metal bellows are connected, which increase the effectiveness of their work to a considerable degree, especially when in the delivery conduit, hydraulic hammer originates and breaks the continuity of fluid flow and the rarefied zone (vacuum) is formed; the generalized algorithm of the calculation of the analogous damping devices of hydraulic hammers, which legitimacy is confirmed by experimental researches at the laboratory stand is developed.

Auth.

7.B1.25. Calculation of key parameters of vacuum mechanisms of driving vacuum-drum. /N. Molodini, R. Molodini/. Mining Journal. – 2010. – #1(24). – pp. 85-87. – geo.; abs.: rus., eng.
The methods of calculation of a self-supporting vacuum mechanism is discussed in the article. There are also given the formulas and norms of SVM (pistons, cylinders and other key parameters), also the ways of creation of a compact vacuum-drive with a high pulling factor. The vacuum-drum key parameters are calculated for dry and liquid friction as poly-tropical and isothermal expansion of air. It is proved that in liquid, i.e. in the non-rigid hydrodynamic operating mode, the pulling factors of a drive are much higher, while dimensions are considerably compacter.

Auth.

7.B1.26. Calculation of a safe distance during underwater blasting operations. /N. Bochorishvili, A. Neverov, N. Machavariani/. Mining Journal. – 2010. – #1(24). – pp. 88-89. – geo.; abs.: rus., eng.
The processes taking place during underwater blasting of shots are considered. The data on danger that may be caused to persons working under water by the excessive pressure resulting from blasts within the shock wave front are given. The available safety regulations provide only minimum values of safe distances which in most cases are insufficient and the persons concerned might be badly injured. The article provides recommendations for calculating safe distances and preventing possible injuries.

Auth.

7.B1.27. On combination scattering of light. /K. Gorgadze, G. Chikhladze, T. Peradze/. Newsletters of Academy of EducationScience of Georgia. – 2010. - # 1(16). – pp. 104-106. – geo., abs.: rus., eng.
The article treats the combination scattering of light from two points of view, based on the principally different theories – quantum and classic. It is shown that the explanation of the same phenomenon from different positions and views simplifies the correct perception of the phenomenon, its study and application. The combination scattering of light is studied in crystals and liquids.

M. Kopaleishvili

7.B1.28. Induced combination scattering of light. /K Gorgadze, G. Chikhladze, T. Peradze/. Newsletters of Academy of Education Science of Georgia. – 2010. - # 2(17). – pp. 152-156 – geo., abs.: rus., eng.
The article deals with the induced combinatory scattering of light. The reason and the mechanism of rising of this phenomenon are shown. It is pointed out that due to the nonlinearity of absorbing-scattering medium the resonant phenomena arise tending the strong oscillations of nuclei of atoms of the medium; as a result, the induced combinatory scattering of light is observed.

M. Kopaleishvili

7.B1.29. Inversion of the distribution function of photoheated charge carriers during their capture by oppositely charged centers. /E. Khizanishvili, M. Khizanishvili/. Caucasus International University Herald. – 2010. - #2. – pp. 75-80. – eng.; abs.: geo, eng., rus.
Studied is the probability of creation of inverse distribution function of photoelectrons during capture on the attractive Coulomb centers in the strictly determined conditions, when thermal-collision (TC) mechanism dominates. It is established that when inelastic processes of energy scattering control electrons lifetime $\tau_c(\varepsilon)$ the inverse form of distribution function can be also obtained on the positive centers during the capture. This was impossible in the process of capture during domination of lax cascade mechanism.

Auth.

7.B1.30. On bundary pressure origination upon water hammer. /Z. Charbadze/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 18-19. – geo., abs.: geo., eng., rus.
This paper assesses pressure at the boundary barrier at the moment of a water hammer. It has been f ound that pressure is not fixed during the whole period of contact with the barrier. The solution of the specific problem requires that the current process be examined and assessed as a whole and only after that be divided into intervals. Thereafter, the interval having the most impact on the erosion process should be selected.

Auth.

B2. Chemistry. Biology

7.B2.1. Treatment of copper-bearing water in plating plants. /R. Gotsiridze, L. Kontselidze, L. Loria, A. Ispirian, T. Kajaia, N. Meparishvili/. Science and Technologies. – 2010. - #4-6. – pp. 17-19. – geo., abs.: eng., rus.
The article presents a scheme of operation in the circulatory mode of an electrodialysis plant without feeding a solution to saline tract. The scheme is used for treatment of water in galvanic production. The combination of two electrodialysis plants and using storage capacity allow creating a closed system of the water-supply for washing details after the coppering process.

Auth.

7.B2.2. The biochemical adaptation mechanisms of living organisms to water deficit. /N. Aleksidze, M. Tarasashvili, G. Aleksidze/. Science and Technologies. – 2010. - #4-6. – pp. 20-28. – geo., abs.: eng., rus.
The article deals with the problem of water deficit having arisen under the impact of aggressive ecological environment that endangers the living world, as well as with biochemical mechanisms of adaptation to water deficiency in various organisms. It is shown that the processes of adaptations involve low-molecular compounds and specific proteins; in parallel, the transformation of tissue structures takes place.

Auth.

7.B2.3. The early postmortal changes of the honeybee body image during gas-discharge visualization (GDV). /R. Gagua, V. Osmanova, E. Gedevanishvili, L. Giorgobiani, A. Kapanadze/. Science and Technologies. – 2010. - #4-6. – pp. 32-34. – geo., abs.: eng., rus
The article deals with the technology of obtaining of GVD images of a honeybee without premedication developed by using Prof. Korotkov's GDV technique (St. Petersburg, Russia), as well as with the GDV imaging of honey and distilled water droplets with the original technology. As a result, 3 groups were identified: 1. alive honeybees; 2. dead honey-covered honeybees; 3. Dead honeybees washed out by distilled water. After 48 hours of GDV imaging, the total lethality of the honeybees was observed. No streamer was detected between the test subjects and the honey droplets. It is obvious that honey serves as a protector against static electrical discharge. The anti-streamer effect of honey is lost after the honey is removed by the distilled water. At this time, a difference between both the alive and dead washed as well as between the honey-covered and washed honeybees is detected. Because of this, there were not detected statistically significant differences between GDV-images of the 1st and 2nd groups. We found statistically significant differences between the 1st and 3rd groups by the CF parameter and between the 2nd and 3rd groups by the M and CF parameters (fractal parameters). Conclusion: early postmortal changes of honeybees during GDV are expressed in changing of fractality of GDV images.

Auth.

7.B2.4. Hepatoprotective effect of verapamil during hemorrhagic shock in an experiment. /M. Gvaladze, T. Gegeshidze, Gr. Sulaberidze, G. Didava, M. Chkhaidze, I. Tavzarashvili, T. Buachidze, M. Svanidze/. Science and Technologies. – 2010. - #7-9. – pp. 117-121. – geo., abs.: eng., rus.
During a hypoxic state, including during a period of hemorrhagic shock, lyses of the liver parenchymal cell membranes occurs due to calcium ion excess. The membrane protection from such a pathologic process is theoretically possible by the calcium-channel blocking agent – Verapamil, which was used to study its hepatoprotective effect. Modelling of the hemorrhagic shock was performed by the method of Wiggers-Feine. Blood was exfused from sedated male cats (Nembutal 40mg/kg, intravenous blood exfusion 40ml/kg) till arterial blood flow drop to 40 mm/Hg (HS60). During artificial ventilation - 130-150 ml/min/kg in the period of 1 hour, pH in the arterial blood was 7,35-7,45, P_{O2} – 90mm/Hg, airflow measurement was controlled by "Corning "device. Resting of the animal was performed by blood exfusion. On 80-90 minutes after the blood exfusion liver edge were taken and rinsed with 2% osmium acid and 0,1mol phosphatic buffer and glutar aldehide. Contrasting was carried out by uranil acetate. Extracted material was examined by electronic microscope JEM-100B (Japan). 2 series of experiments were done on male cats – hemorrhagic shock model (n=5. 10 animals in total) and throughout the effect of verapamil (dose 0,250mg/kg i/v), which together with the physiologic solution did not exceeded 1/20 of the exfusion volume. As a result of experimental data, it is clear that in Hemorrhagic shock model, Calcium L channel blocker – verapamil is characterized by slightly expressed hepatoprotective effect on the 80-th min of the blood exfusion.

Auth.

7.B2.5. Intensification of ultrafiltration process of gamma globulin solution. /Sh. Rukhadze, R. Lomaia/. Georgian Scientific News. – 2010. - #1(5). – pp. 49-54. – rus., abs.: geo., eng., rus.
The work gives the advantage of application of a membrane division process upon product ion of gamma globulin, as compared with the existing standard methods, also the core regimes and design of membrane devices are established. It has been established that during a pulsing mode of flow, the membrane permeability without pulsation increases and achieves maximum in the area δ=1,2. It is revealed that for concentration of gamma globulin, the best membrane is УАМ-450. It is shown that at pressure P=0,1±0,01 mp, speed of division makes 65 l/m^2h.

Auth.

7.B2.6. Dehydration of hydrosilylation products of α-glycols containing terminal acetylene bond. /K. Cherkezishvili, R. Kublashvili, K. Giorgadze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 60-62. – eng.; abs.: geo., eng.
Dehydration reaction (pinacoline rearrangement) of hydrosilylation products of some α-glycols containing terminal acetylene bond is studied. Dehydration products (products of pinacoline rearrangement) are isolated and identified. Comparison of these products with products formed under conditions of hydrosilylation (Speier's catalyst in isopropyl alcohol) of acetylene α-glycols allows concluding that in the latter case pinacolines are not formed.

Auth.

7.B2.7. Thermodynamic analysis of CoO, NiO, CuO, FeO interaction with methane. /J. Bagdavadze, A. Kandelaki, K. Ukleba, Z. Tsikaridze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 63-66. – eng.; abs.: geo., eng.
Complete thermodynamic analysis of reduction of CoO, NiO, CuO, FeO by methane is presented. Initial structures have been chosen on the basis of the following reactions: 1. $CoO_{(cd)} + CH_{4(gas)}$; 2. $NiO_{(cd)} + CH_{4(gas)}$; 3. $4CuO_{(cd)} + CH_{4(gas)}$; 4. $4FeO_{(cd)} + CH_{4(gas)}$; 5. $4FeO_{(cd)} + 2CH_{4(gas)}$. The calculations are performed at atmospheric pressure in the temperature range 300-1500 K with application of computer program ASTRA-4. The basic results are presented in the form of diagrams (dependence of the contents of components on temperature).

Auth.

7.B2.8. The regularities of electrolytic dissociation of camphoric acid. /E.Kvaratskhelia, R. Kvaratskhelia, R. Kurtanidze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 67-69. – eng.; abs.: geo., eng.
The parameters of dissociation of camphoric acid in its dilute (0.0001-0.01M) solutions were determined with the aid of original exact and approximate equations.

Auth.

7.B2.9. Effect of geographic origin of sea buckthorn on the triacylglycerol composition of its fruits. /A. Vereshchagin, V. Tsydendambaev/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 92-100. – eng.; abs.: geo., eng.
Separate geographic forms of sea buckthorn (*Hippophae rhamnoides* L.) are characterized not only by different composition of triacylglycerols (TAGs) of their fruit mesocarp oil, but also by a different biosynthetic pattern of the TAGs. Siberian, Central Asian, and Baltic forms contain TAGs, which include mostly hexadecenoic ($C_{16:1}$) and palmitic ($C_{16:0}$) fatty acid (FA) residues and are synthesized according to the theory of 1,3-Random, 2-Random Distribution of FAs between the respective OH groups of glycerol. At the same time, the mechanism of formation of TAGs of the Caucasian form rich in the residues of $C_{16:0}$ and octadecenoic acid ($C_{18:1}$) is in accordance with the theory of Restricted Random Distribution of FAs. The occurrence of two different patterns of TAG biosynthesis in the mesocarp of the same biological object is demonstrated here for the first time. As for seed oils, the geographic forms studied here virtually do not differ from each other in the FA composition of their TAGs.

Auth.

7.B2.10. Molecular mechanism for the phylogenetic change of thermostability of fibril-forming collagen. evidence that (Gly-X-Hyp) triplets are main factors determining stability of collagen. /T. Burjanadze, E. Kiziria, S. Mikeladze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp.137-141. – eng.; abs.: geo., eng.
Published data relating the concentration of 4-hydroxyproline residues to the stability of collagen was used to estimate the different effects of two types of triplets: (Gly-X-Hyp) and (Gly-Pro-Hyp). The data comprised mainly fibril-forming collagens, which exhibit highly cooperative helix-coil transitions at temperatures that are remarkably close to body temperature. A wide range of denaturation temperatures was therefore ensured by including collagen from different species of fish, including some living in the arctic, amphibians and mammals. As a first approximation, the dependence of the denaturation temperature, T_d, of collagen on hydroxyproline content was considered as a linear function: $T_d = T_0 + K_1N_{(GXO)} + K_2N_{(GPO)}$, where the coefficients K_1 and K_2 characterize the degree of influence of the two types of triplet. Regression analyses

showed that K_1 exceeded K_2 by about 10 times. Analysis of the dependence of the enthalpy of denaturation on hydroxyproline content also showed that triplets of the type (Gly-X-Hyp) containing water had a larger effect than (Gly-Pro-Hyp) triplets and that the primary factor determining increased stability was the concentration of (Gly-XHyp) triplets, while (Gly-Pro-Hyp) triplets governed the nonlinear character of the relationship. We conclude that the main factor stabilizing the collagen triple helix and governing the phylogenetic change of collagen thermostability is the concentration of triplets of the type (Gly-X-Hyp).

Auth.

7.B2.11. Influence of iron ions on the electrode properties of manganese dioxide. /G. Tsagareli, N. Maisuradze, L. Batsanadze, A. Shakarishvili, Sh. Makhatadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2010. – vol. 36. – #1. – pp. 16-18. – rus.; abs.: geo., eng.

During electrodeposition of manganese dioxide temperature decreasing of the stock solution and the anodic current density increasing led to the bath voltage and oxygen evolution rise. Ferrous ions addition to the electrolyte gave the same result. Such behavior has been explained by including iron impurity into manganese dioxide which resulted in anode polarization and oxygen evolution increasing. Influence of the iron ions on the electrode properties.

Auth.

7.B2.12. Manganese dioxide powder preparation for chemical current source. /G. Tsagareli, N. Maisuradze, L. Batsanadze, A. Shakarishvili, Sh. Makhatadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2010. – vol. 36. – #1. – pp. 19-20. – rus.; abs.: geo., eng.

Manganese dioxide powder has been prepared by electrochemical method at low temperature in the bulk solution. It has been shone, that manganese dioxide prepared in presence of polyvinyl alcohol or aniline addition to the electrolyte increased by 33% alkaline sell capacitance.

Auth.

7.B2.13. Pyrroloindole. Condensation Reactions of the base 3,8–diformyl-1H, 10H–benzo[e] pyrrolo[3,2-g]indole. /Sh. Samsoniya, M. Trapaidze, N. Nikoleishvili, N. Kuprashvili, D. Zurabishvili, U. Kazmaier/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2010. – vol. 36. – #1. – pp. 21-24. – rus.; abs.: geo., eng.

The condensation reactions of 3,8-diformyl-1H,10H-benzo[e]pyrrolo[3,2-g]indole with the following nucleophilic agents - aniline, p-adamantylaniline and thiosemicarbazide, were carried out in order to synthesize new biologically active compounds. The nucleophilic addition and elimination reactions were accomplished in area of ethyl alcohol, pH 4-5. Bifunctional Schiff-bases-dianyle, diadamantylanyle and dithiosemicarbazone, containing benzopyrroloindole rings were synthesized.

Auth.

7.B2.14. Modified semiconductor structures for infrared lasers. /O. Davarashvili, M. Enukashvili, T. Kamushadze, Sh. Mirianashvili, M. Dzagania/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2010. – vol. 36. – #1. – pp. 39-41. – rus.; abs.: geo., eng.

The article proposes a new approach for increasing the internal quantum efficiency by doping active layers by special impurity that decreases their lattice constant. Together with high heterobarrier, this factor will cause increasing of operating temperatures of the lasers. Such impurities facilitate also the laser effect on several frequencies simultaneously. It is realized in the strained layers on the dielectric substrates and in the structures with two or three active layers.

Auth.

7.B2.15. Investigaion of lead selenide's epitaxial layers at opposite signs of deformation. /G. Gegiadze, R. Gulyaev, O. Davarashvili, M. Enukashvili, A. Berdzenishvili, M. Dzagania/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2010. – vol. 36. – #1. – pp. 42-44. – rus.; abs.: geo., eng.

The results of an investigation of thin strained layers PbSe, grown on NaCl and KCl substrates are presented in this article. It is revealed that maximal rest elastic deformation is limited by defects in the substrates. Negative mismatch – 50% from whole mismatch on the KCl substrates is achieved. Increasing of the width of the forbidden gap may correspond to 120-130 MeV.

Auth.

7.B2.16. Quantum-chemical modeling of the mechanism of formation of the peptide bond. /T. Zarqua, J. Kereselidze, Z. Pachulia, M. Qvaraia/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2010. – vol. 36. – #1. – pp. 45-47. – rus.; abs.: geo., eng.

The article is devoted to quantum-chemical modeling of the mechanism of formation of a peptide bond. The new mechanism of formation of the peptide bond is offered, which can be used for regioselective synthesis of protein, by means of an irradiation by Femtosecond Laser Pulses.

Auth.

7.B2.17. Dehydration of liquefied gas by zeolites. /T. Andronikashvili, L. Eprikashvili, T. Kordzakhia/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2010. – vol. 36. – #1. – pp. 48-52. – rus.; abs.: geo., eng.
The paper discusses some aspects of the dehydration of various gas systems for household and industrial use by synthetic and natural zeolites.

Auth.

7.B2.18. Thermodynamic analysis of a series of composites of B-O-N-C heterogeneous system. /D. Eristavi, A. Gogishvili, A. Sarukhanishvili, N. Bibiluri, N. Kutsiava/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2010. – vol. 36. – #1. – pp. 53-57. – rus.; abs.: geo., eng.
Thermodynamic analysis of series of composites of B-O-N-C system containing (weight %): B_2O_3 - 52.0838, N_2 - 20.9582, C - 26.958) at alternating amount of carbon from 0.25 to 10.0 mole was performed. Phase diagrams were construed for various temperatures within the frames of 800 - 3800K. Optimal conditions of obtaining of target products were defined according to the content of the composites and temperature.1

Auth.

7.B2.19. The influence of diffraction grating to the analyzed light waves train's length. /A. Rcheulishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2010. – vol. 36. – #1. – pp. 58-62. – rus.; abs.: geo., eng.
The diffraction grating is more and more applicable in studying the light spectrum. This is because of its advantage (benefit) comparative with other devices with the same functions. The grating not only effectively decomposes the light on it, but also changes some light properties. For example, if the light waves train with the given wave length that falls on the diffraction grating contains the equal amplitude of *n* number absolute waving (*n* impulse), with the diffraction grating influence the mentioned waves train's length will become n+N-1, where N is the number of transparent splits of diffraction grating. The influence of diffraction grating make the amplitudes of waves train's impulses change. The influence of grating make the waves train's amplitudes grow during the waves of N number. Then the waving amplitudes are equal, as to the last waving, it happens with the reduced amplitudes. The amplitudes change step by step.1

Auth.

7.B2.20. Artificial gels - gelatin and agar-agar, their properties and applications. /I. Berdzenishvili, M. Siradze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2010. – vol. 36. – #1. – pp. 67-69. – rus.; abs.: geo., eng.
The classification of gels is given. It is shown that concentration of solution, nature of molecules and dispersion medium, temperature, time factor, electrolytes, pH of medium influence the process of gelation. Agar gels are much denser than those of gelatin and set and melt at a higher temperature. The received results make it possible to optimize the process of production of new products.

Auth.

7.B2.21. Physicochemical research of some hydrosulfuric curative waters. /G. Jincharadze, N. Bokuchava, D. Jincharadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2010. – vol. 36. – #1. – pp. 70-75. – rus.; abs.: geo., eng.
In hydrosulfuric waters of Georgia, content and activity values of the basic characteristics of sulfidic balance - H_2S, HS^-, S^{2-}, *pH*, *Eh*, as their amounts were determined through experimental and computational methods. The low (negative) values *Eh* for all waters testify to the recovery conditions remaining at the water rise to surface. Of much attention is the negative value of *Eh* calculated by computational method against the experimentally obtained one. The detected dependences between the characteristics of the sulfidic balance are reviewed.

Auth.

7.B2.22. Simultaneous electrochemical production of copper and manganese dioxide in one electrolyser from nitric acid solutions. /I. Kakhniashvili, J. Shengelia, D. Ekvtimishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 294-295. – rus.; abs.: geo., eng.
The simultaneous process of electrodeposition of copper on the cathode and manganese dioxide on the anode has been studied in nitric acid solutions in an electrolytic cell with diaphragm. The optimal parameters of the process were established.

Auth.

7.B2.23. Crystal structure of barium hydroacetate-$Ba_2(Ch_3coo)_2h_2[(Ch_3coo)_3h_2[(Ch_3coo)_3]$. /G. Tsintsadze, N. Endeladze, A. Chubinidze, A. Mamulashvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 324-329. – rus.; abs.: geo., eng.
The crystal structure of barium hydroacetate – $Ba_2(CH_3COO)_2H_2[H(CH_3COO)_3H_2[(CH_3COO)_3]$ was determined on CAD-4-SDP diffractometer. The technical part of analysis was carried out in IREA (Moscow). Barium hydroacetate is triclinic crystal with the following parameters: a=7,408(2), b=12,726(2), c=14,817(5)

Å; α=90,64(2), β=102,63(8), γ=87,11(7)^0; ρ_{calc}=1,835(7) g/sm^3; z=2; space group $P\bar{1}$; registered - 4784 reflexes, used – 3258; R=3,8; R_w=4,8.

Auth.

7.B2.24. Zeolites in the process of desiccation of organic solvents and oil-products. /T. Andronikashvili, T. Kordzakhia, L. Eprikashvili, I. Rubashvili, M. Dzagania/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 330-335. – rus.; abs.: geo., eng.

Some aspects of application of synthetic and natural zeolites in the process of desiccation of organic solvents and oil-products are shown. The research of application of zeolites in the process of liquid-phase desiccation of several oil-products proved the expediency and perspectives of their application.

Auth.

7.B2.25. Diffusional mismatch in semiconductor heterostructures: conditions of occurrence and ways of overcoming its negative influence on radiative devices. /O. Davarashvili, G. Darsavelidze, L. Bychkova, M. Enukashvili, M. Dzagania, A. Pashaev, V. Aliyev, V. Zlomanov/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 336-338. – rus.; abs.: geo., eng.

The ways of overcoming negative consequences of mismatch of lattice constants in the heterostructure layers caused by diffusion of components in the process of epitaxial growth are shown after the example of heterostructure of type PbSeTe/PbSnSeTe. The heterostructures with active layers both less than inverse and more than inverse compositions are considered. For the first time, conditions when "pulling up" of a composition of the emitter to the composition of an active layer or doping of layers allows improving characteristics of radiative devices are established.

Auth.

7.B2.26. Investigation of rheological properties of Co-Fructose-Askangel. /Ts. Gabelia, L. Japaridze, E. Saluqvadze, L. Kashia, K. Ebralidze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 339-346. – rus.; abs.: geo., eng.

The process of structure formation in high dispersed and Co-fructose-askangel suspensions has been studied. By determining the rheological parameters, it has been established that Co-fructose-askangel in (pH=2) suspensions with a short decay period makes one-degree-lower-strength structures as compared with superfine askangel. The presented data corresponds to the requirements to medical compounds.

Auth.

7.B2.27. Study of the effect of inhibitors on the photochemical oxidation of petroleum bitumen. /E. Usharauli, N. Khetsuriani, K. Goderdzishvili, T. Shatakishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 353-355. – rus.; abs.: geo., eng.

The main sphere of application of oil asphalt is highway engineering and industrial objectives. Along with other factors, the stability of road bitumen is defined by the effect of sunlight causing its untimely deterioration. The article presents the results of investigation of photochemical oxidation of high boiling fractions of Norio oil and revealing of the effective and accessible inhibitors for this reaction.

Auth.

7.B2.28. The application of laumontite in vegetable growing. /S. Urotadze, T. Kvernadze, N. Osipova, L. Japaridze, Ts. Gabelia, E. Salukvadze, L. Kashia/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 376-380. – rus.; abs.: geo., eng.

The effects of natural zeolite-laumontite, both in its natural state and treated by iron chelate on the growth of various vegetables (tomatoes, onions, eggplants, and pepper) have been studied under laboratory conditions. According to the study results, it has been established that laumontite, treated by iron chelate, has positive effects on the growth, development, and yield of the above-said vegetables.

Auth.

7.B2.29. Investigation of nano-modification of alunite-containing rocks with sulfur oxide for the purpose of their use as a cement additive. /G. Tsintskaladze, R. Skhvitaridze, B. Keshelava, T. Sharashenidze, G. Tatarashvili, M. Burjanadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 384-387. – rus.; abs.: geo., eng.

A possibility of nano-modification with sulfur oxide of alunite-containing rocks from the Adjara deposit has been investigated for the purpose of their application as a cement additive. The structural changes having place upon modification of these materials are examined, and the content of SO3 has been established.

Auth.

7.B2.30. On the classification of synthetic diamonds under conditions of reagentless electroflotation. /N. Gegia, G. Zviadadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 388-389. – rus.; abs.: geo., eng.

Some questions on the classification of synthetic diamonds with electric flotation have been considered. Based on an analysis of the processes defining the hardness and the strength of solid bodies, it has been

established that the resistance of diamonds must be characterized by their hardness. Proceeding from the complex structure of the electronic double layer in interphase of solid phase (diamond) and liquid phase (electrolyte) and the mobility of the diffusion layer, the advisability of the electrokinetic potential determination for analysis of electrolytic flotation is stressed. The determination results evidence a direct dependence of the electrokinetic potential on electrolyte concentrations and size of particles of synthetic diamond powder.

Auth.

7.B2.31. Prospects of Norio oil residue utilization for production of road bitumen. /L. Topuridze, G. Khitiri, T. Gabunia, T. Shatakishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 389-390. – rus.; abs.: geo., eng.

Based on the investigation of the physical and chemical properties and of the chemical group composition of high-molecular Norio oil residue, the residue is found to be the applicable raw material for the production of road bitumen.

Auth.

7.B2.32. Possibility of practical use of modified lignins. /M. Jeiranishvili, V. Khanikian/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 403-406. – rus.; abs.: geo., eng.

Two directions of processing chemically modified lignins are analyzed: the large-tonnage thermochemical processing technique and the small-tonnage one directed at production of bioactive compounds.

Auth.

7.B2.33. Chemical modification of grapevine waste lignin. /M. Jeiranishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 407-408. – rus.; abs.: geo., eng.

The ways of extraction and chemical processing of lignin from large-tonnage grapevine waste are considered. Chlorination and amination are selected as the chemical modification methods. The optimal conditions for preserving the basic structures of lignin are selected and discussed

Auth.

7.B2.34. Miticidal activity of an ointment preparation on *Rhipicephalis sanguineus* mites. /G. Chimakadze, O. Lomtadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 409-410. – rus.; abs.: geo., eng.

A miticidal ointment preparation of prolonged action has been developed where the synthetic pyrethroid - cypermetrine is used as the main active substance, while the montmorollonite Askana clay (enriched form) and natural carbohydrates (mineral oil, Vaseline) are used as ingredients. The ointment activity was tested on three adult dogs and five puppies infested with the *Rhipicephalis sanguineus* species mites. The results of the carried out experiments proved that in 10 minutes after treatment of the animal skin with the preparation the semi-hungry and hungry imagos were paralyzed and died within 24 hours. The satiated female mites were paralyzed in 10-20 minutes after contamination, the paralyzed and dead mites falling from the skin after 35-40 hours. None of the female imagos collected from the treated skin revealed the egg-laying ability. Their death was fixed after 4-5 days.

Auth.

7.B2.35. New ways of getting arsenic sulphide - Arsenic(V)-Stibium (V)-Oxide. /M. Rusia, M. Kopaleishvili, K. Giorgadze, N. Sagaradze, K. Rukhaia/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #4. – pp. 443-446. – rus.; abs.: geo., eng.

The work deals with new methods of production of arsenic sulphide - Arsenic(V)-Stibium (V)-Oxide. Synthesis of the aforementioned compounds was carried out by treating the arsenic-containing extract and the produced Stibium(V)-Oxides with a weak mixture of pentaoxide ammonium. By transformation of the intermediate product - arsenic acid the target product is obtained.

Auth.

7.B2.36. A comparative assessment of the results of differential-impulse polarographic and roentgeno-fluorographic spectroscopy methods of analysis of heavy metals in a biological sample (tree leaves). /T. Chelidze, L. Enukidze, N. Khavtasi, M. Chankashvili, I. Kharischarishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #4. – pp. 460-462. – rus.; abs.: geo., eng.

The present work deals with the determination of the content of heavy metals in a biological sample (tree leaves) by means of the differential-impulse polarographic and roentgeno-fluorographic spectroscopy methods. The obtained results show that the both methods can be applied for the quantitative determination of heavy metals.

Auth.

7.B2.37. Radiation – chemical transformation of aqueous solutions of the dye "direct red – 2C". /R. Tushurashvili, M. Panchvidze, G. Shanidze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #4. – pp. 463-465. – rus.; abs.: geo., eng.
Radiolysis of 0.001% aqueous solutions of the dye "direct red – 2C" has been studied in the absence as well as in the presence of the additive - sodium persulfate. It was established that under the radiation action the discoloration of the solutions takes place. In particular, after irradiation the discoloration degree makes 47%. An addition of sodium persulfate causes an increase of the discoloration degree. For example, upon addition of 0.25 – 1.5 g persulfate, the discoloration is practically constant and makes 90%.

Auth.

7.B2.38. On changes of effective diffusion areas in high temperature oxidation of Al_2O_3 forming alloys. /I. Nakhutsrishvili, O. Mikadze, G. Mikadze, N. Maisuradze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #4. – pp. 466-471. – rus.; abs.: geo., eng.
The obtained new equations of high temperature oxidation of alumina forming alloys correctly describe the simultaneous processes of mass transport and diminution of effective diffusion area. The revealed kinetic aspects bring about the known deviations from a strictly parabolic growth low of oxide scales on the investigated heat resistant alloys.

Auth.

7.B2.39. Elaboration of high voltage nickel–manganese oxide spinels as cathode materials for Li-ion accumulators. /E. Kachibaia, R. Akhvlediani, R. Imnadze, T. Paikidze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #4. – pp. 472-474. – rus.; abs.: geo., eng.
The phase-pure, superfine $LiM_xNi_{0,5-x}Mn_{1,5}O_4$-type compounds (M= Co, Cu, Al; $0 \le x \le 0,5$) with a cubic structure, similar to $LiMn_2O_4$ structure were synthesized as high voltage cathode materials for lithium–ion accumulators (LIA). The intricate dependence of sample's space lattice parameters on doping degree (x) was identified. Doping leads to structure stabilization. Test results confirm the possibility of synthesized compounds' utilization as 5V cathode materials of LIA. The produced compounds could be of significant interest for the next generation lithium-ion batteries not only in the field of portable equipment, but also for application in high-power electric motors.

Auth.

7.B2.40. Study of some characteristics of epitaxial layers of lead tellurides. /G. Gegiadze, R. Guliaeva, O. Davarashvili, M. Dzagania, M. Enukashvili, A. Pashaev, V. Aliev, V. Zlomanov/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #4. – pp. 475-477. – rus.; abs.: geo., eng.
The thicknesses of PbTe layers grown by a method of 'hot-wall'" molecular epitaxy are studied. The results of researches of the structural-morphological features of layers, normal and tangential components of the lattice constants are also cited. These data can serve as modeling ones for growing PbTe on BaSeTe substrates.

Auth.

7.B2.41. Division features of swelled perlite. /K. Khachaturian, L. Makharadze, G. Mchedishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #4. – pp. 489-494. – rus.; abs.: geo., eng.
A chromatographic analysis of Paravani perlite - both, swelled and plated forms has been carried out with immovable liquid phase polidymethylsiloxane (PMS)-200. Also, the optimal quantity of immovable liquid phase has been established. The selectivity and asymmetry coefficients, some criteria for division of binary mixture and adsorption values of heat have been counted as well. It has been shown that the plating quality PMS-200 15% could be used for division of n-paraffin C_5 - C_{10} and C_6-C_9 aromatic hydrocarbon mixtures.

Auth.

7.B2.42. Chromatographic analysis of light oil fractions using swelled perlite. /K. Khachaturian, L. Makharadze, G. Mchedlishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #4. – pp. 495-498. – rus.; abs.: geo., eng.
A chromatographic analysis of swelled perlite has been carried out with immovable liquid phase plated polidymethylsiloxane (PMS)-200. The possibility of its utilization for separating light fractions into components as well as for identifying individual compositions of these fractions in oil deposits of Georgia, such as, Norio, Satskhenisi, Samgori has been studied. The best separation has been found to occur at 60^0C.

Auth.

7.B2.43. Physicochemical aspects of rational use of Tskhaltubo mineral waters. /G. Jincharadze, B. Gogichaishvili, N. Bokuchava, D. Jincharadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #4. – pp. 499-502. – rus.; abs.: geo., eng.

The latest and most comprehensive data on the chemical compound of Tskaltubo mineral waters are given. The basic composition of the unique waters has been found unchanged for more than a century. The possibility of utilization of a third of the daily yield of the waters for balneological purposes is established. The basic curative properties of the waters – chemical content, the concentration of radon and temperature - have been found to be practically unchanged.

Auth.

7.B2.44. Alkaloids of some plants of the family *Ranunculaceae* growing in Georgia. /L. Kintsurashvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #4. – pp. 506-507. – rus.; abs.: geo., eng.
The composition of alkaloids in plants of the family *Ranunculaceae*: *Helleborus caucasicus* A. br., *consolida orientalis* (J.Gay), *consolida divaricata* (Ledeb.) Schrödinger, *clematis vitalba* L. , *ranunculus sceleratus* L was studied. In the research models of plants dominate alkaloids: delkocine and lycoctonine. Of practical significance are the varieties: *consolida orientalis* (J.Gay) Schroding. and *consolida divaricata* (Ledeb. Shroding.; of theoretical significance – *helleborus caucasicus* A.br., *clematis vitalba* L., and *ranunculus sceleratus* L.

Auth.

7.B2.45. Geometries of boron nitride's multi-walled nanotubes and multi-shelled fullerenes. /L. Chkhartishvili, T. Berberashvili/. Nano Studies. - 2010 - №2. - pp. 15-21. - rus..; abs.: geo., eng.
Based on models of boron nitride BN regular nanotubes and regular fullerenes, the interpolation formulas of their radii are constructed. Using them, the possible sequences of nanotubular and fullerene-like layers, respectively, in multi-walled nanotubes and multi-shelled fullerenes are predicted. Obtained results have revealed universal correlation between intra- and interlayer bond lengths in all boron nitride layered structures.

Auth.

7.B2.46. Titan carbide based nano-crystalline solid solutions: production and compacting. /A. Gachechiladze, A. Mikeladze, D. Gabunia, B. Margiev, R. Chedia, T. Tsuladze, R. Zekalashvili, O. Tsagareishvili/. Nano Studies. - 2010 - №2. - pp. 23-29. - rus..; abs.: geo., eng.
Titan carbide-based nano-crystalline solid solutions TiC + Ni (10 %) have been obtained by the chemical synthesis method in reaction between titanium hydride compounds and carbide-forming and binding components. Nickel has been chosen as the binding metal. A theoretical thermodynamic analysis performed for the ternary system (Ti − C) − Ni (10 %) has shown that TiC and TiNi compounds are able to be formed within the wide interval of concentrations, (28 − 48) wt. %. For obtaining of the TiC + Ni (10 %) nano-crystalline powders titanium hydride, nickel chloride and soot were used as starting materials in charges in molar ratios as Ti : C : Ni = 1 : 1 : 0.1. The obtained product TiC + Ni was a black agglomerated nano-crystalline powder. Further, the produced powders were compacted in two stages, applying a specially designed spark-plasma-synthesis plant. The full-stroke compacting of powders takes (3 − 4) min. The proposed method of synthesis allows retaining nano-crystalline structure even in compacted samples and goods.

Auth.

7.B2.47. UV−Vis and FT−IR spectra of ultraviolet irradiated collagen in the presence of antioxidant ascorbic acid. /N. Metreveli, K. Jariashvili, L. Namicheishvili, D. Svintradze, E. Chikvaidze, A. Sionkowska, J. Skopinska/. Nano Studies. - 2010 - №2. - pp. 53-64. - eng.; abs.: geo., eng.
The influence of deleterious UV radiation on collagen molecules in the absence and presence of ascorbic acid using UV−Vis and FT−IR spectroscopy has been studied. Intensity of UV−Vis absorption spectrum of collagen with a maximum at 275 nm due to the aromatic residues (tyrosine and phenylalanine) increases with the increasing dose of UV radiation. This effect is significantly hindered in the presence of antioxidant ascorbic acid. Intensities of FT-IR bands (amide A, B, I and II) of collagen decrease with the increase of the UV radiation dosage. Intensities of bands are also decreased in the presence of ascorbic acid. Results suggest that increasing the concentration of ascorbic acid increases the photo-stability of collagen, and the collagen becomes less sensitive to UV radiation. It is possible that hydrogen bonds form between the groups N − H of collagen and C = O of ascorbic acid. It is believed that under UV radiation free radicals appear in acid soluble collagen and resulting in photo-degradation of the macromolecule restore due to the ability of ascorbic acid donating one or two electrons. Increasing the dose of radiation causes more molecules of ascorbic acid to slow down, and their antioxidant effect is diminished accordingly.

Auth.

7.B2.48. Microbial synthesis of metal and semiconductor nanoparticles. /N. Tsibakhashvili/. Nano Studies. - 2010 - №2. - pp. 65-70. - eng.; abs.: geo., eng.
The work presents a brief overview of the current research worldwide on the use of microorganisms such as bacteria and actinomycetes (both prokaryotes), as well as algae, yeast, and fungi (eukaryotes) in the biosynthesis of metal and semiconductor nanoparticles and their application.

Auth.

7.B2.49. Heat capacity of the 3D and 2D systems according to interatomic chemical bonding. /Z. Gogua, G. Kantidze/. Nano Studies. - 2010 - №2. - pp. 85-94. - eng.; abs.: geo., eng.
Values of bonding energies of sp^3 and sp^2s^- hybrid bonding are calculated in the paper. These calculations are performed according to the conception of the influence of anti-bonding quasi-particles on the interatomic bonding force when the bonding particle takes an anti-bonding position. Melting process of covalent crystals is considered and the critical concentration of anti-bonding quasi-particles, at which the melting process begins, is defined. It may be caused not only by temperature, but by action of light, injection of charge carriers and in other ways. Within the Einstein's model of solid, the heat capacity is calculated for 3D crystal as well as 2D systems.

Auth.

7.B2.50. Boron nitride nanostructures: molecules, sheets, tubes, fullerenes (an overview). /L. Chkhartishvili/. Nano Studies. - 2010 - №2. – pp. 139-174. - eng.; abs.: geo., eng.
An overview of the present state of studies in synthesizing methods, atomic geometry, binding, stability, electron structure, and applications of boron nitride BN nanosystems is given. In particular, the explicit expressions in term of B−N bond length are obtained for atomic sites coordinates and intersite distances in regular boron nitride nanotubes and fullerenes.

Auth.

7.B2.51. Preparation of iron oxide nanoparticles by laser ablation method. /V. Kvachadze, T. Pavliashvili, G. Abramishvili, T. Kalabegishvili, V. Gabunia/. Nano Studies. - 2010 - №2. – pp. 175-177. - rus.; abs.: geo., eng.
The a-Fe_2O_3 nanoparticles are obtained in distilled water by the laser ablation method (using Laser OGM − 20). Their sizes have been determined by the X-ray diffraction, scanning and transmission electron microscopies. Alongside with large-scale agglomerates, product contains nanoparticles with sizes about (10 − 20) nm.

Auth.

7.B2.52. Synthesis of silver nanoparticles using bacteria. /N. Tsibakhashvili, T. Kalabegishvili, V. Gabunia, E. Gintury, N. Kuchava, N. Bagdavadze, D. Pataraya, M. Gurielidzse, D. Gvarjaladze, L. Lomidze/. Nano Studies. - 2010 - №2. – pp. 179-182. - eng.; abs.: geo., eng.
A simple route for the synthesis of silver nanoparticles by *Spirulina platensis* (cianobacteria) and *Streptomyces* spp. 211A (actinobacteria) has been demonstrated in this work. The silver nitrate solution incubated with bacteria biomass changed to a yellowish color, indicating the formation of silver nanoparticles. Spectroscopic analysis demonstrated that tested solutions yielded the maximum absorbance peak at 425 nm due to silver nanoparticles. Also, X-ray analysis of the bacterial biomass confirmed the formation of silver nanoparticles.

Auth.

7.B2.53. On relative stability of single-walled boron nitride nanotubes. /L. Chkhartishvili, I. Murusidze/. Nano Studies. - 2010 - №2. – pp. 183-212. - eng.; abs.: geo., eng.
The molar binding energy of boron nitride's single-walled zigzag and armchair nanotubes is calculated within the quasi-classical approach. Its oscillation depending on the tube radius is found out in the range of ultra-small-radii. Nanotubes (1,1), (3,0), and (4,0) are predicted to be more stable species among single-walled boron nitride nanotubes.

Auth.

7.B2.54. Human in bioethical space and time. /Archimandrite Adam (V. Akhaladze)/. – 2010. –239 p. – geo.; abs.: geo., eng., rus.
The work considers such issues as bioethics as a science, ideology, culture, health and illness as interrelated concepts, thanatology and bioethics, the essence of prenatal diagnostics, as well as various aspects of transplantology and euthanasia, prevention and prognosis in bioethics.

Auth.

B3. Geology. Geodesy

7.B3.1. Mud volcano – index of oil-bearing capacity of a territory. /U. Zviadadze, Z. Gaganidze/. Science and Technologies. – 2009. - #10-12. – pp. 31-37. – geo., abs.: eng., rus.
On the basis of systematization and generalization of various actual and analytical materials regarding mud volcanoes of Tsiv-Gombori Ridge, the oil-bearing prospects of deep horizons of the Middle and Upper Jurassic deposits of the studied territory are shown.

Auth.

7.B3.2. Results of paleomagnetic investigations of cretaceous and paleogenic rocks of Georgia. /B. Asanidze, I. Tabaghua-Khaburzania, N. Odikadze, Gr. Abdushelishvili, T. Zuliashvili, M. Gamkrelidze/. Science and Technologies. – 2010. - #7-9. – pp. 22-27. – geo., abs.: eng., rus.
A study of cretaceous and Paleogenic rocks of on the territory of Georgia has shown that their usability for paleomagnetic investigations. Based on the available and newly obtained results, a scheme of tectonic reconstruction for the Late Cretaceous Age has been developed.

Auth.

7.B3.3. Snow-ice caves and natural glaciers of Georgia. /K. Tsikarishvili, N. Bolashvili, Z. Janelidze, T. Karalashvili, L. Kutateladze/. Science and Technologies. – 2010. - #7-9. – pp. 28-34. – geo., abs.: eng., rus.
The thermal regime of snow-ice wells and abysses, as well as that of natural glaciers formed in the volcanic, lava and dolerite rocks and sandstones and the conditions of occurrence of long-term snow and ice creation in them are presented in the work.

Auth.

7.B3.4. Relaxation processes in the alterations of the average annual temperature of the earth. /M. Dzhibladze, A. Mikaberidze, Z. Razmadze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 49-52. – eng.; abs.: geo., eng.
Alterations of the average-annual temperature of the Earth are shown to be characterized by relaxation oscillations within every 5-8 years. More low-frequency oscillations with a period of about 60 years are also observed. The relaxation processes are connected with changes in the Earth's albedo, quantity of the evaporated water and the absorption of the solar radiation by green plants. Cycles of solar and human activity also influence the processes of temperature relaxation. The relaxation oscillations are caused by a negative feedback between parameters of the Earth and energy received by the Earth from the Sun.

Auth.

7.B3.5. Investigation of dynamics of temporal distribution of acoustic waves caused by stick-slip process. /T. Matcharashvili, T. Chelidze, N. Zhukova, E. Mepharidze, A. Sborshchikov/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 53-55. – eng.; abs.: geo., eng.
We investigated dynamics of acoustic wave generation during stick-slip motion of sample rocks. For that, laboratory spring-slider system has been developed enabling registration of acoustic waves generated by stick-slip (SS) at different sliding regimes and relative external forcing. To create these time series, experimental recordings were conditioned, wave trains separated and onsets of the acoustic emission (AE) detected. For quantitative evaluation of changes in dynamics of acoustic wave generation, nonlinear recurrence quantitative analysis (RQA) and Tsallis entropy calculation method have been used. It was shown that the amount of deterministic structure in dynamics of acoustic wave temporal distribution depends on movement regime.

Auth.

7.B3.6. Age of the Madneuli Cu-Au deposit, Georgia: evidence from new nannoplankton data. /R. Migineishvili, T. Gavtadze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 85-91. – eng.; abs.: geo., eng.
A possible model for formation of the Madneuli copper-gold deposit incorporates a sequence of magmatic, tectonic and hydrothermal events occurring contemporaneously with sedimentation of host volcanosedimentary rocks in a shallow paleosea basin. Identification in these rocks of some biostratigraphic units (CC 20 Zone and CC 22c Subzone) of fossil nannoplanktons enabled the authors to conclude that formation of the Madneuli deposit occurred in Campanian age. Furthermore, dating of the major part of the geological events, proposed by the model, is narrowed down to a short time span of CC 22c nannoplankton Subzone of the Campanian stage. This age is consistent with earlier geochronological findings.

Auth.

7.B3.7. Assessment of geotechnical conditions of the Delisi depression. /T. Jajanidze/. Mining Journal. – 2009. – #2(23). – pp. 12-16. – geo.; abs.: rus., eng.
This article is dedicated to reviewing of geotechnical problems related to the Delisi Depression situated in Tbilisi, Georgia, and also to physical-mechanical and lithologic-stratigraphic study of the depression soil matrix. In spite of the fact that the depression area mentioned above is almost fully developed (urbanized),

disputes and revision of engineering requirements, regarding the genesis of the above depression, still makes actual detailed study of the depression. To solve these questions, the works were carried out within extension of the Delisi Depression, particularly on the A. Kazbegi Avenue, for precise forecasting of construction site stability and necessary normal operating conditions for building. To solve the engineering tasks, a priority was given to determination of necessary percentage content of limestone for development of suffusion processes in rocks of the Upper Eocene, which represents a required factor to be considered from the point of view of geotechnical assessment of buildings and structures construction sites within the Delisi Depression.

Auth.

7.B3.8. Underground reservoirs of lava generation and their role in formation of underground water resources. /L. Kharatishvili, T. Gabetsadze, Z. Kakulia/. Mining Journal. – 2009. – #2(23). – pp. 17-20. – geo.; abs.: rus., eng.

The work concludes that within the Samtskhe-Javakheti lava plateau along the axial zones of buried paleo-valleys quite well-marked underground reservoirs are distinguished, the underground water resources of which provide stability and regulation of minimum flow of rivers. At the same time, the period of full water cycle of underground waters in the reservoirs is about seven years, which mainly depends on the reservoir capacity. The bulk of the underground water resources of the underground reservoirs have no genetic connection with the underground waters formed during high waters of the rivers floods, rain or snow thaw, for this part of underground water is a mixture (cocktail) of waters formed during the previous years. This is proved by too low value of variation of coefficients of average annual discharge of rivers of the region.

Auth.

7.B3.9. On the Middle-Late Jurassic marine biota of Georgia. /T. Lominadze, M. Topchishvili, I. Tsereteli, V. Todria/. Mining Journal. – 2010. – #1(24). – pp. 19-21. – geo.; abs.: rus., eng.

The analysis of Middle-Late Jurassic marine biota of Georgia revealed that the number of ammonites' genera reaches maximum in Callovian and minimum in Middle Oxfordian. The picture is quite different as to distribution of corals and microfauna. They are rear in Callovian and rich in Middle Oxfordian. The formation of coral reefs created unfavorable conditions for development of ammonites.

Auth.

7.B3.10. New data on Liassic belemnitids of Georgia. /Sh. Keleptrishvili/. Mining Journal. – 2010. – #1(24). – pp. 21-24. – geo.; abs.: rus., eng.

The work deals with the results of Liassic belemnitids investigation in Georgia. A numerous complex of these cephalopod mollusks includes 26 species (united in 12 genera and 2 subgenera). Out of them, the following 8 species (*Orthobelus soloniecensis* (Lis.), *Nannobelus mariniacensis* (Lis.), N. sp. (sp. nov.?), *Bairstowius cf. junceus* (Phil.), *B. cf. charmouthensis* (Mayer), *Passaloteuthis laevigata* (Zieten), *P. carinata* (Hehl in Zieten), *P. dayi* (Lang)) were found for the first time on the territory of Georgia. The work gives an analysis of stratigraphic and geographic distribution of Georgian Liassic belemnitids.

Auth.

7.B3.11. Characteristics of mudflows of the River Aragvi catchment basin. /G. Beridze, N. Inanashvili/. Mining Journal. – 2010. – #1(24). – pp. 24-26. – geo.; abs.: rus., eng.

The right bank of the River Aragvi canyon on the section of villages Mleta–Pasanauri is characterized by frequent powerful mudflows along the right inflows of the river which cause a considerable damage to the nearby numerous settlements and serious hindrances to the movement of motor transport on the Georgian-Military Highway (GMH). On the basis of a complex analysis of the geomorphologic, hydrologic and climate conditions, also of the geological structure peculiarities of the district, the main factors of the origin and further development of mud foci are considered. The classification of the main types of the studied mudflows is given, depending on the stage of their development, and the preventive measures are designed for each type of mudflows.

Auth.

7.B3.12. Additional control condition of geodetic intersections. /M. Meskhi, D. Papava, G. Chiaureli, K. Dzadzamia/. Mining Journal. – 2010. – #1(24). – pp. 43-44. – geo.; abs.: rus., eng.

A principally different control condition of geodetic intersections is discussed. This condition, in contrast to the existing one, foresees a condition of directive angles of the sides, ensuring a greater confidence and reliability when solving concrete engineering tasks. The novelty is of both theoretical and practical significance.

Auth.

7.B3.13. Study of the stability of base gravity stations (BGS) of Enguri arch dam according to natural observation data. /D. Papava, I. Mamatsashvili, T. Papava/. Mining Journal. – 2010. – #1(24). – pp. 45-48. – geo.; abs.: rus., eng.

Several issues regarding a study of some aspects of the stability of BGS, their location invariability using geodetic methods for deformation detection are considered. There are several methods of the BGS stability study by means of formation of simple geodetic networks (linear, linear-angular, angular and combinations thereof), but all of them require additional constructions and measurements. The paper attempts to study station location error in relation to each other by means of the error ellipses. Since only three studies have been executed at Enguri hydropower station by means of new electric equipment: total station TC-2003 and level DNA- 03, for comprehensive investigation of the dam's deformation the above-mentioned studies need to be continued.

Auth.

7.B3.14. Investigation of fracturing in rock samples by an acoustic method. /R. Samadashvili, F. Bejanov, N. Sarjveladze, L. Tkemaladze/. Mining Journal. – 2010. – #1(24). – pp. 54-57. – geo.; abs.: rus., eng.
The measurement of discrete parameters of elastic waves reflected in the course of fracturing of rock samples, as well as the methods of the establishment of a range of alteration of some discrete parameters of the seismic wavelet are considered.

Auth.

7.B3.15. Assessment of geological engineering conditions of Digomi (Georgia) enclosed depression. /T.Jajanidze/**.** Mining Journal. – 2010. – #2(25). – pp. 8-11. – geo.; abs.: geo.; eng., rus.
This work represents a review of geological engineering conditions and physical-mechanical properties of filler soils of the Digomi Enclosed Depression which is situated in Tbilisi, Georgia. This Depression was studied by researches in detail; nevertheless, at the present time, it is still topical issue to study particularity of its origin and engineering-geological conditions. In this point of view, every new survey conducted on the Digomi Enclosed Depression area is of a great interest. The work makes an emphasis on the construction site (which is intended for a storage construction in perspective) located at the South-East part of the Depression, close to the so–called "rock barrier". With this purpose the engineering-geological survey was carried out at the above construction site.

Auth.

7.B3.16. Modern geodynamical processes in Meskheti and Javakheti. /G. Dokhnadze, H. Salukvadze, K. Dadiani, I. Pirtskhalaishvili/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 82-91. – geo., abs.: geo., eng., rus.
The paper describes geological and geomorphologic peculiarities of the area, including modern geodynamical processes and the tendencies of their development. The quantitative measures of the factors defining the processes are given schematically.

Auth.

7.B3.17. Some issues regarding filtration of heavy clay soils in Kolkheti Lowland. /I. Zakaidze, L. Kekelishvili/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 96-98. – geo., abs.: geo., eng., rus.
This paper considers the issues regarding the filtration of heavy clay soils in the Kolkheti Lowland. The tests implemented to determine the value of initial filtration gradient are given and the variation in filtration coefficient, depending on an increase in the pressure gradient during the swollen conditions are considered. The paper describes the participation of the existing cohesive soil flows in filtration flow.

Auth.

7.B3.18. Transformation of separate seismic waves in Kolkheti shelf zone. /I. Iordanishvili, K. Iordanishvili, E. Khosroshvili, I. Makharadze/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 130-136. – geo., abs.: geo., eng., rus.
This paper includes general information about the publications regarding the earthquakes in the Black Sea, which cause separate waves – tsunami. Also, we have analyzed the disastrous results of tsunami in the Black Sea, which were stipulated by a length of tsunami (45-110 km), velocity of distribution (120-400 km/hour) and height (up to 7 m), which can be considered as equal to wind wave. The theoretical transformation of separate wave was calculated on the basis of the Green's theorem, taking into account different depths of Kolkheti zone. The results of report coincide with observations.

Auth.

7.B3.19. Development of engineering measures for the protection of erosive slopes. /I. Iremashvili/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 137-145. – geo., abs.: geo., eng., rus.
The paper describes the existing conditions of erosive slopes on the highways of Georgia and measures for their protection. The survey sections were not considered as subject to bioengineering measures and, the survey revealed the dynamics of their impairment with time. The damaged sections were covered with a layer of reinforced concrete using the method of filling. The implemented measures revealed that the above-

mentioned method can be used to suspend erosive processes because of its efficiency, technological simplicity and availability. The method can be considered as one of the erosion preventive measures for the conditions of Georgia.

Auth.

7.B3.20. Classification of methods to control soil properties. /L. Itriashvili, N. Nibladze/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 146-149. – geo., abs.: geo., eng., rus.
The paper includes a new general classification of methods to control soil properties, which maximally combine all constituent elements. General scopes are as follows: mechanisms of implementation, recommended additives and soils, general technological operations, derivative structures.

Auth.

7.B3.21. Protection of slopes against erosion using new polycomplex SSBM. /Kh. Kiknadze, N. Nibladze, I. Khubulava/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 166-171. – geo., abs.: geo., eng., rus.
The paper describes a complex protection of slopes by means of plant sowing and polymeric coating. Also, there are given data about the following components: water resistant polymeric coating of equivalent friction, resistance to water and wind erosion, different intensity of rain and changeability in wind force, temperature and water regimes under the protected surface, plant growth and vegetation, and recommended doses of polycomplexes for the different types of soils.

Auth.

7.B3.22. Permissible velocity of soils taking into account surface molecular effects. /T. Katsarava, Sh. Kupreishvili, P. Sichinava/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 224-227. – geo., abs.: geo., eng., rus.
The paper describes flushing velocities in the designed model taking into account surface molecular effects, which radically change the quantitative value of these parameters. Moreover, the existing designed models suit solid sediments only, and cannot be trusted in the case of finely dispersed clays. On the basis of a simple model, the quantitative prediction regarding the intensity of erosion in accordance with normal value of permissible velocity and quantitative relation were assessed.

Auth.

7.B3.23. Some questions of the the relief surface schematizations and the rain drain simulation. /G. Chitishvili, L. Kekelishvili/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 232-235. – geo., abs.: geo., eng., rus.
The article presents the results of applying the schematizations of the relief surface and its mathematical description for simulation of rain drain. The cross section of the relief element consisting of two slopes and a river bed between them is examined together with the rules of the coordinate curving of the relief characteristics and the possibility of calculating other indices of flow and relief.

Auth.

7.B3.24. Hydrogeological zoning and hydrogeochemical zonality of Greater Caucasus. /B. Zautashvili, B. Mkheidze, T. Pitava/. Proceeding of Institute of Hydrogeologi and Engineering Geology. – 2010. – vol. XVII. - pp. 22-31. - rus.; abs.: geo., eng.
The folded zone of Greater Caucasus includes hydrogeological regions of special types, in which, on the bases of their geological structure and collector features of water-bearing strata, distinguished are: platform, intermontane, slope and medial artesian basins (porous, fissure-porous and fissure-carstic ground waters), hydrogeological massifs, admassifs and intermassifs (fissure, fissure-vein, fissure-bedded, bedded-fissure and fissure-carstic ground waters) and volcanogenic basins (porous-fissure covers of ground waters). According to recent principles of hydrogeological zoning and considering variegated geological and hydro-geological structure of the Folded zone of Greater Caucasus, there are segregated hydrogeological regions of first, second and third order. By difficulty of spreading and chemical compound of ground water, there is conditioned allocation of A, B, C and D hydrogeochemical zones and sub zones: B_3, B_{10}, B_{35}, C_{70}, C_{40}, and C270, C_{350} for artesian pools and D_1, D_3, D_{10}, $D_{35\ for}$ hydrogeological massifs, admassifs and intermassifs. According to lateral and vertical spreading of ground water, there are determined main characteristics of the Caucasus hydrogeochemical zonality. The results of performed investigations are given on the “Schematic map of Caucasus hydrogeological zoning and hydrogeochemical zoning” compiled by the authors.

Auth.

7.B3.25. Hydrogeology of eastern part of the Caucasus within the topographical sheet К-(38), (39). /B. Zautashvili, B. Mkheidze/. Proceeding of Institute of Hydrogeologi and Engineering Geology. – 2010. – vol. XVII. - pp. 32-48. - rus.; abs.: geo., eng.
The article characterizes the water bearing complexes and horizons developed in Eastern part of Caucasus, gives the hydrogeological division of region and a scheme of hydro chemical zoning.

Auth.

7.B3.26. Thermal parameters of rocks and temperature distribution in the water-bearing complex of Tbilisi central region's hydrothermal water deposit. /L. Glonti, E. Sakvarelidze, G. Melikadze, G. Kobzev/. Proceeding of Institute of Hydrogeologi and Engineering Geology. – 2010. – vol. XVII. - pp. 54-58. - rus.; abs.: geo., eng.
Average heat conductivity coefficients have been estimated in 20 boreholes of Tbilisi central region's hydrothermal water deposit. The thermograms data of the investigated boreholes were used for the purpose. The heat flow was measured for each borehole, depending on the average heat conductivity values. The calculations were based on heat conductivity coefficient measurements in Tbilisi area boreholes as well as similar rocks of other Georgian regions and the planetary data (4 options). The temperatures of the Middle Eocene roof and the bottom of the boreholes (in the Middle Eocene rocks) have been measured.

Auth.

7.B3.27. Comparative characterization of thermal parameters of three districts of Tbilisi thermal water deposit. /L. Glonti, E. Sakvarelidze/. Proceeding of Institute of Hydrogeologi and Engineering Geology. – 2010. – vol. XVII. - pp. 59-62. - rus.; abs.: geo., eng.
Values of heat conductivity coefficients and heat flows for the Lisi-Saburtalo, Central and Oil districts of the Tbilisi thermal water deposit are given. The cited data are based on both direct measurements of heat conductivity coefficients and thermograms in boreholes of the investigated area and on literature sources.

Auth.

7.B3.28. Underground feeding of Kobuleti bogs. /I. Mikadze/. Proceeding of Institute of Hydrogeologi and Engineering Geology. – 2010. – vol. XVII. - pp. 75-78. - rus.; abs.: geo., eng.
Based on research data, the artesian waters of the quaternary sediments of Kobuleti Lowland are in close hydraulic relationship with the subsoil water horizon. The artesian waters feed groundwaters and assist thus in retaining their high levels, which, in turn, feed bogs. Based on the above, it may be concluded that the underground waters of the quaternary sediments represent, together with precipitation, are the main source of feeding the Kobuleti bogs.

Auth.

7.B3.29. The first basic hydrogeological studies in the former USSR. /Yu. Bogomolov, D. Manukian/. Proceeding of Institute of Hydrogeology and Engineering Geology. – 2010. – vol. XVII. - pp. 128-132. - rus.; abs.: geo., eng.
The article is devoted to the 70th anniversary of All-Union Scientific-Research Institute of Hydrogeology and Engineering Geology - VSEGINGEO and the 100th anniversary of its founder and the first director Academician G.V. Bogomolov. The basics of experimental-filtration hydrogeological works in the former USSR and the role of Moscow Mining Academy student G.V. Bogomolov in this sphere are described.

Auth.

B4. Geography. Cartography. Astronomy

7.B4.1. Modeling of radiation and temperature environment of the Mars for biological experiments. /Sh. Sabashvili, S. Tsereteli, M. Tarasashvili, N. Alexidze/. Science and Technologies. – 2010. - #7-9. – pp. 14-21. – geo., abs.: eng., rus.
The article studies the variation of illumination E on the Mars surface caused by solar radiation during a planetary year and planetary day. The Sun's midday zenith distance zmin annual variability shape for the different meaning of the planetografical latitude is discussed. Based on the orbital parameters of Mars, the arrangement of spring and autumn equinox as well as summer and winter solstices points in Martian sky are discussed with respect to the point of Mars perihelion on the Martian orbit. Distances from the Sun to the Mars are calculated for the 15 selected values of Mars true anomaly. At the same time, zmin is calculated for above mentioned 15 points of the Martian orbit along with the value E for the selected 12 moments of the Martian day for the Martian equator optimal in terms of temperature for the survival of terrestrial living organisms.

Auth.

7.B4.2. The bioremediation problems of the Mars ground and the atmosphere forming. /N. Alexidze, M. Tarasashvili/. Science and Technologies. – 2010. - #7-9. – pp. 35-44. – geo., abs.: eng., rus.
The introduction of anabiotic life-forms on the Mars planet has been investigated. Presumably, sulfur, Iron and other autotrophic bacteria with anabiotic capabilities will be able to adapt to such abiogenic factors of the Mars as the extreme temperature and radiation, thus realizing bioremediation of the Martian soil and the planetary ecopoesis.

Auth.

7.B4.3. On the primeval ocean. /R. Kiladze, E. Khelaia, T. Salukvadze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 42-44. – eng.; abs.: geo., eng.

Taking into account the thermal dissipation of hydrogen from the atmosphere for a period from the Earth's origin, it is concluded that the level of the primeval ocean must have been 4 km higher than the contemporary one. Because of flooding of a considerable part of land, the tidal friction was essentially reduced, allowing us to explain the great age of the Moon.

Auth.

7.B4.4. Short-term forecasting of extreme winds by a regional mesoscale numerical model. /I. Chogovadze, N. Dekanozishvili, N. Kutaladze, L. Megrelidze, G. Mikuchadze, Z. Khvedelidze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 56-59. – eng.; abs.: geo., eng.
The present paper presents an assessment of the capacity of explicit short-term forecasting of extreme events, using the weather numerical mesoscale model WRF ARW, which was demonstrated with respect to the strong wind event case in Tbilisi on the 9th of January 2009. The model simulation is in very good agreement with the process tracking and maximum intensity prediction. As for quantitative prediction of such variables as surface maximum wind speed, the statistical calibration should be carried out additionally.

Auth.

7.B4.5. Natural resource potential of Western Georgia and territorial management of agrolandscapes. /T. Urushadze, Z. Seperteladze, E. Davitaia, B. Kalandadze, T. Alexidze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 74-78. – eng.; abs.: geo., eng.
Agrolandscape study has quite a long history in Georgia, as the natural resource potential of the country and agro-resource potential greatly depends on it. A scientific research aimed at implementing the program of drainage of highly humid and swamp soils of Kolkheti and their agricultural utilization was carried out. A complex analysis of the natural resources of Western Georgia was carried out by modern methods of research. In view of the average indices of hydrothermal coefficient, the study has revealed the space distribution peculiarities of agrolandscapes. All the modifications of the Western Georgian agrolandscapes have been researched and a new model of their territorial organization has been elaborated. This model enables us to reveal the natural resource potential of the region, structural stability of agrosystems and to find optimal ways for improving the ecological situation.

Auth.

7.B4.6. Marine influence on the atmospheric pollution in the Ajara coastal zone. /R. Solomonidze/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp. 79-84. – eng.; abs.: geo., eng.
The influence of aerosols of marine and continental origin on the level of atmospheric pollution is studied for the coastal zone (Ajara as an example). The influence of variations of the level of atmospheric pollution on the number of parameters forming the climate – temperature, water vapor resilience, relative humidity and wind speed has been considered.

Auth.

C. TECHNICAL AND APPLIED SCIENCES. SECTORS OF ECONOMY

C1. Power Industry

7.C1.1. Natural waters as the national wealth of the country. /K. Makharadze, R. Pirtskhalava/. Science and Technologies. – 2009. - #10-12. – pp. 16-18. – geo., abs.: eng., rus.
Natural water resources of the world and particularly of Georgia are analyzed; unique properties of water and its importance for the life processes are consider; the connection between these properties and water molecules structure is shown.

Auth.

7.C1.2. Prospects of the sea waves energy utilization. /R. Kenkishvili, M. Glonti, T. Natriashvili/**.** Science and Technologies. – 2010. - #7-9. – pp. 45-48. – geo., abs.: eng., rus.
The expediency and prospects of the use of sea waves energy are considered. Converters of sea waves energy developed in different countries are considered, together with a scheme and the principle of operation of the converter developed in Rafael Dvali Institute of Machine Mechanics.

Auth.

7.C1.3. Role of energy in revival of Georgian economy. /G. Nanuashvili/. Science and Life. - 2010 - №2. - pp. 16-22. - geo.; abs.: geo., rus., eng.
Based on the current demand for and consumption of energy resources, their natural reserves are faced with almost complete exhaustion in the second half of the 21st century. Accordingly, it is necessary that alternative energy resources be searched for. Given a rich hydro-resource potential of Georgia, the authorities have decided to build new HPPs. Seven of them are being built by a Turkish company. The construction of Khudoni HPP is also planned. However, all the above is not enough to resolve such a

problem as high electricity fees. Georgia has also a good potential of solar and wind energy as well as thermal waters, the potential of which has not been used up to now.

Auth.

7.C1.4 Georgia's energy problems and possibilities of their optimal solving. /I. Rekhviashvili, R. Arveladze, Z. Gordeziani, T. Pirtskhalava, M. Basiladze, G. Sologashvili, S. Makharadze/**.** Mining Journal. – 2010. – #2(25). – pp. 74-81. – geo.; abs.: geo.; eng., rus.
According to annual electricity consumption per capita (1.6 thousand kWt/hour/man), Georgia significantly lags behind both the developed countries (11-37) and the former USSR republics (1.7 – 6.3), this being indicative of a low level of Georgian economy and of a decreased electricity consumption. The low consumption rather than energy abundance is the main reason explaining the potential of its exporting. There several local sources for making up the energy shortage, including: new 300MW power units in Gardabani TPP, installing gas turbine equipment to the existing boiler houses of TPPs, building seasonal HPPs, completion of Khudoni HPP, building nuclear power plants, usage of nontraditional, renewable sources of energy, building of a coal-fired TPP in Georgia. As a result of the analyses, it is obvious that from the point of economic and technical trustworthiness, the generation of power from local sources, from Tkibuli coal has the best advantage. This will not only secure power safety of the country but also bring USD 120-140 million profit annually.

Auth.

C2. Electrical Engineering. Electronics. Radio Engineering. Communications

7.C2.1 The unified potentiostat of an independent dc power-supply system. /I. Kamkamidze, L. Jinjikhadze, Sh. Pkhakadze/. Science and Technologies. – 2009. - #10-12. – pp. 97-101. – geo., abs.: eng., rus.
The work presents a unified potentiometer belonging to the potentiomerts used in independent dc power-supply systems. It provides for coordinated operation of elements of an independent power-supply system, without using generators or accumulators. Moreover, internal combustion engine is excited was carried out was carried out by an engine starting system as well as by a storage battery. The using of the unified potentiostat makes it possible to save electric energy upon complete charging of storage batteries and minimum speed of the generator runner, as well as to improve operational characteristics of the storage battery and generators and increase their durability.

Auth.

7.C2.2 Determining the welding current of multi-pointed contact welding. /T. Pkhakadze, M. Shalamberidze/. Science and Technologies. – 2009. - #10-12. – pp. 102-104. – geo., abs.: eng., rus.
The article deals with a highly efficient method of quality control of two-way multi-pointed contact welding according to the welding process parameters. The efficiency of the parameters' measurement is analyzed and the measurement of the welding current on all the electrodes and of the real values during welding is proposed, with an allowance for shunting.

Auth.

7.C2.3 Spin transport properties of manganese doped nanostructured magnetic semiconductors. /P. Kervalishvili**/.** Nano Studies. - 2010 - №2. - pp. 5-14. - eng..; abs.: geo.,_eng.
A technology of periodic layer GaSb / Mn nanostructure getting, the structural and magneto-transport properties of thin GaMnSb films with increased content of Mn, up to 10 at. %, grown by using laser dispersion in vacuum was studied. The structures of GaMnSb layers, regardless of Ga replacement by Mn acceptors, contain ferromagnetic MnSb nanoclusters and shallow acceptor defects controlled by the growth temperature were investigated. In the obtained double phase ferromagnetic GaMnSb films, regardless of the case of previously studied single phase GaMnSb systems (Curie temperatures not exceeding 30 K), the anomalous Hall effect (AHE) and the AHE hysteresis at temperatures up to 300 K, becoming stronger with the hole concentration increase, are observed. The unusual properties of GaMnSb films have been interpreted as interaction of magnetic nanoclusters in a semiconductor matrix, where the matrix has huge concentration of free holes and magnetic ions, becoming stronger with an increase in the holes concentration. The magnetotransport properties of GaSb/Mn discrete alloys to be used as ferromagnetic contacts in the process of formation of GaMnSb / GaSb / GaMnSb and GaMnSb / GaAs / GaMnSb three-layered structures for observation of spin polarized current in perpendicular geometry were studied. The model problem concerning the formation of a ferromagnetic cluster (magnetic polaron) consisting of a free electron bound to a non-magnetic donor impurity in an anti-ferromagnetic matrix was analyzed. The magnetic polaron was shown to also produce rather long-range extended spin distortions of the anti-ferromagnetic background around the core. Such a magnetic polaron state can be favorable in energy, in comparison to the usually considered one. Studies of the structure of magnetic poltroons (nanoscale ferromagnetic droplets) in magnetic semiconductors were performed with a special emphasis on frustrated lattices' (square lattice with nearest-neighbor and diagonal interactions and the triangular lattice)

characteristic for layered heterostructures. It was demonstrated that the magnetic polaron can produce rather extended spin distortions of the anti-ferromagnetic background around its ferromagnetic core. The characteristic size of this 'coat' decreases for a stronger next-nearest neighbor interaction or with an increase in magnetic anisotropy.

Auth.

7.C2.4 On elaboration of optoelectronic elements exploiting properties of nanosilicon formed in "silicon-on-sapphire"-structure. /R. Kazarov, R. Chikovani, D. Garibashvili, G. Goderdzishvili, T. Khachidze/. Nano Studies. - 2010 - №2. – pp. 119-121. - rus.; abs.: geo., eng.
The article is devoted to very interesting and perspective issue – the formation of solid-state optoelectronic elements based on light-emitting nanostructural silicon and heteroepitaxial structure "silicon-on-sapphire". The main technological problems to be solved for making various optoelectronic elements are outlined.

Auth.

7.C2.5 Photoelectric parameters determination for ALGaAs heterostructure-based photo-cells by a conctacless method. /A. Guchmazov, G. Iluridze, T. Minashvili, G. Rtveliashvili, M. Taktakishvili/. Nano Studies. - 2010 - №2. – pp. 123-125. - geo.; abs.: geo., eng.
The work describes a conctactless method of investigation of photo-cell heterostructures. It is shown that in such semiconductor structures parameters, like the photogenerated charge carriers' internal interassembly collection coefficient, can be estimated based only on observations of their luminescence radiation.

Auth.

C3. Automation & Telemetry. Computer Engineering

7.C3.1 The dynamic mode of analog testing control. /K. Chapidze, Z. Papidze/. Science and Technologies. – 2010. - #4-6. – pp. 39-42. – geo., abs.: eng., rus.
The article considers how to automate testing of a dynamic mode, taking into account the parameters of the dynamic characteristics obtained under the action of a single impulse at the input device which provides a precise definition of the error of the analog devices in a short time interval.

Auth.

C4. Mining. Metallurgy. Chemical Industry

7.C4.1. New methods of obtaining fine-grained and nanosized composite materials. /O.Okrostsvaridze, G. Tavadze, T. Badzoshvili/. GEN. – 2010. - #1. - pp. 48-56. - eng.; abs.: rus.
The work deals with the possibilities of obtaining fine-crystalline materials by applying two-stage integrated technological schemes: self-propagating high-temperature synthesis (SHS)+super-rate tempering of the liquid melt and SHS+gas-flame dispersion. As a result of spinning of the SHS-melt on a fast-rotating copper drum, a quenching product of a lamellar shape is obtained. The thickness of foil fragments is 30-60 μm. The electron-microscopic investigations showed that the dimensions of phase constituents of the composite Al_2O_3-NiAl (Ni_3Al) varied from nano- to micrometric dimensions. At the same time, there was observed a heterogeneous distribution of Al_2O_3 and NiAl on the area of the direction of melt spinning, which pointed to heterogeneity and non-stationary flow of high-temperature melt. For increasing the ductility of microparticles, it is necessary to clad the surfaces of powders or granulate them, as well as to select relevant methodology of disintegration for providing the shape of particles maximally approximated to the isometric one.

Auth.

7.C4.2. New ceramic and metal-ceramic powders for gas-thermal coatings. /O. Okrostsvaridze, G. Tavadze, T. Badzoshvili, J. Alania/. GEN. – 2010. - #1. - pp. 57-63. - eng.; abs.: rus.
In the presented work, a new method of obtaining compound ceramic and metal-ceramic composite powders by using the technology of self-propagating high-temperature synthesis (SHS) is proposed. The investigations for establishing the correlation between the parameters of original charge and the combustion parameters – T_{comb} and U_{comb} were performed. The morphological specific features of the synthesized composites were studied.

Auth.

7.C4.3. Special frits for direct-on enamelling of pipelines. /I. Berdzenishvili, M. Siradze, V. Erokhin, R. Kldiashvili/. GEN. – 2010. - #1. - pp. 64-67. - eng.; abs.: rus.
The compositions of low-melting zirconium-strontium frits have been developed for direct-on enameling of pipes. Owing to the given combination of active cations, toxic fluorine and expensive nickel and lithium were eliminated from glass frit compositions. The enamels were subjected to firing by the induction method. In the synthesized enamels, the optimal complex of properties combining high corrosion-resistant and thermo-

mechanic indices, adhesive strength and required specifications was realized. These enamels are recommended for testing on pipelines.

Auth.

7.C4.4. The contact fatigue and the wear of DADI class aluminium cast iron. /E. Kutelia, N. Khidasheli, G. Beradze, O. Tsurtsumia, I. Beroshvili/. GEN. – 2010. - #1. - pp. 74-79. - eng.; abs.: rus.
In the present work, the results of experimental investigations of contact fatigue and wear of deformable high-strength aluminum cast iron of ADI (DADI) class depending on the phase ratio in the metallic matrix are given. It is shown that the modification of cast iron melt with the magnesium vapor allows obtaining the low-silica (0.5-0.7% Si) high-strength cast iron in which the concentration of sulfur does not exceed 0.002%. Besides, the type and the degree of austenite transformation of the produced cast iron can easily be varied so that the required ratio of phase components such as upper bainite, lower bainite, martensite, carbide and retained austenite could be provided in the metallic matrix and hence could be achieved the desired hardness over the range of 30-57HRC. The rolling and rolling-with-creep wear tests were carried out on the specimens of different hardness. They showed strong dependence of the contact fatigue and the wear on the amount of retained austenite in the specimens with the optimal ratio of bainite and martensite phase components in the matrix structure. The obtained testing results allow us to treat the high-strength aluminum cast iron of DADI class as an efficient substitute for expensive steel in manufacturing the critical parts for high-pressure multistep gas pumping compressors.

Auth.

7.C4.5. The process of metal-thermal reduction of manganese modelling and determination the optimal parameters of its implementation. /J. Mosia, A. Julukhidze, G. Nikolaishvili, V. Mgeladze, M. Chumbadze/. Science and Technologies. – 2009. - #10-12. – pp. 48-51. – geo., abs.: eng., rus.
The article presents experimental results of establishing optimal parameters of the metal-thermal reduction process of manganese from pre-purified oxides. The obtained technical metal is a semi-product for obtaining particularly pure manganese by method of vacuum sublimation.

Auth.

7.C4.6. The calculation of optimal vibration regimes on the continuous casting machine of Rustavi Metallurgical Works. /V. Ramishvili/. Science and Technologies. – 2009. - #10-12. – pp. 52-55. – geo., abs.: eng., rus.
The article analyzes the ingot-forming equipment's vibration influence on the ingot draw-out effort; it is shown that at the definite vibration regimes, the ingot draw-out effort may be reduced by 20%.

Auth.

7.C4.7. Study of the possibility of obtaining barite and barite-calcite concentrates from Chordy barite-containing waste. /J. Kakulia, Sh. Malashkhia, L. Kartvelishvili, N. Lomidze, V. Totibadze/. Science and Technologies. – 2009. - #10-12. – pp. 44-47. – geo., abs.: eng., rus.
On the basis of preliminary studies of the ore-dressing potential of Chordy barite-containing waste, a possibility of obtaining from them by flotation of barite and barite-calcite concentrates is established. To prepare the material for flotation, a combined disintegration flow sheet ensuring redistribution of barite and calcite particles in different size classes is selected.

Auth.

7.C4.8. The obtaining of superfluxed manganese agglomerate. /J. Mosia, M. Chumbadze, V. Mgeladze, G. Nikolaishvili, A. Julukhidze/. Science and Technologies. – 2010. - #4-6. – pp. 43-46. – geo., abs.: eng., rus.
The article presents the technology for obtaining superfluxed manganese agglomerate to be applied in the medium-carbon ferromanganese melting.

Auth.

7.C4.9. Treatment of thick formations with caving and silting on Tkibuli-Shaori deposit. /A.Mikeladze, M. Basiladze, D. Kupatadze/. Mining Journal. – 2009. – #1(22). – pp. 10-13. – geo.; abs.: eng., rus.
The only process flowsheet for treatment of thick formations with caving and silting on Tkibuli-Shaori deposit is described. A critical analysis of this method is given. For protected seams of coal strata the alternative version of this method developed by the authors is proposed. The proposed method ensures higher security of actual mining production processes, more effective natural ventilation of closed excavations/mines, normal dust-gas regime, and effective struggle against mine fires.

Auth.

7.C4.10. The research of a stress-strained state of a multilayer body under the pressure of the border hard stamps. /T. Iamanidze, M. Losaberidze/. Mining Journal. – 2009. – #1(22). – pp. 14-15. – geo.; abs.: eng., rus.

Using the methods of the theory of analytical functions, the stress-strained state of a laminated prismatic body under pressure of a hard stamp is studied. Based on the analysis, it is determined that in the case of prismatic sandwich bodies with different strength, the presentation of components of the vector displacement tensor strain, is possible with the help of three harmonic functions; their calculation formulas are obtained, which make it possible to establish the point of maximum deformation and determine the maximum deflection (deformation), as well as the trajectory of crack propagation in the area of inhomogeneous stresses. A model allowing for examination of bodies with any number of layers is designed.

Auth.

7.C4.11. Methods of the mechanical destruction of rocks. /G. Baliashvili, F. Bezhanov, R. Samadashvili, L. Gurchumelia, T. Rukhadze, N. Sarjveladze, D. Robaqidze/. Mining Journal. – 2009. – #1(22). – pp. 16-20. – geo.; abs.: eng., rus.

The question of destruction of rock samples by a method of the concentrated, gradual static introduction of spherical indenter on their surface, in which process longitudinal deformation is measured by the indicating gage, is considered; loading increase is carried out continuously and step by step; the destruction of samples occurs in air, water and in the environment of surface-active substance (SAS); instead of the accepted volume work (Joule/cm3), surface specific work on the destruction area (Joule/cm2) is offered; methods of destruction of rocks (marble, sandstone, tuff), and the mechanism of destruction of rocks and the reasons of changing of destruction specific work value are considered.

Auth.

7.C4.12. The computer-aided design of drilling-and-blasting (CAD of D&B) in open pits. /S. Khomeriki, R. Mikhelson, D. Khomeriki, Z. Kuchukhidze, A. Apriashvili, G. Bakhutashvili, K. Antidze/. Mining Journal. – 2009. – #1(22). – pp. 21-25. – rus.; abs.: eng., geo.

The work introduces general methods of engineering a computer-aided design (CAD) of drilling-and-blasting in open pits and the program's main capabilities. The CAD of D&B is developed on the basis of Microsoft Visual Fox Pro, operates in a dialogue (interactive) mode, and performs the following primary tasks: choice of the optimum type of explosive for the given mine's technical conditions with an estimation of their relative working capacity and economic efficiency; calculation of key parameters of drilling and blasting operations; calculation of intervals of delay and choice of optimum schemes of short delay detonations; calculation of radii of dangerous zones at explosion of borehole charges.

Auth.

7.C4.13. Seismic effect on explosive demolition of buildings. /N. Kukuladze, D. Khomeriki, Z. Kuchukhidze, A. Apriashvili, G. Bakhutashvili/. Mining Journal. – 2009. – #1(22). – pp. 25-28. –rus.; abs.: eng., geo.

The results of encoded oscillograms of seismic vibrations generated as a result of building explosion under city conditions are considered. Based on these results, it is defined that during explosive demolition of buildings the intensity of ground vibration in the foundation of engineering buildings is 6-11 times less than during blasting of an explosive of the same mass in the ground. Upon explosive demolition of buildings, a correction coefficient (Ky), which considers terms of forming and spreading of generated seismic vibrations during explosion of buildings, is included in the formula defining the intensity of seismic vibrations.

Auth.

7.C4.14. Establishment of a mineral processing (separation) difficulty value index and its continuous measurement. /M. Gamtsemlidze/. Mining Journal. – 2009. – #1(22). – pp. 29-31. – geo.; abs.: eng., rus.

The article describes the qualitative and quantitative criteria of mineral processing (dressing) difficulty value by graphic-analytical methods. It is noted that the continuous measurement of the difficulty value by the given criterion is impossible and its application as the disturbing value in control processes in the management of heavy-media processing plants is complicated. For optimal control of the mentioned processes, the article proposes such a quantitative criterion of the processing (separation) difficulty value (particularly, density difference index in the layers spaced specified distance apart in the bath or dispersion of given value) that enables continuous measurement of the difficulty value index and optimal control of dressing processes in heavy media machines.

Auth.

7.C4.15. A method of controlling the benefication process in heavy media hydrocyclones. /M. Gamtsemlidze, M. Tutberidze, G. Chkhareuli, I. Samkharadze/. Mining Journal. – 2009. – #1(22). – pp. 31-34. – geo.; abs.: eng., rus.

The article describes a method of mineral processing in heavy media hydrocyclones, which additionally provides a criterion of mineral beneficiation difficulty value and device for its continuous measurement in order to increase qualitative and quantitative indexes of processing, control the hydrocyclone outlet hole diameter and peptizing agent concentration, and establish the mineral beneficiation difficulty value and viscosity, for obtaining a conditioned concentrate with maximum output.

Auth.

7.C4.16. Aspects of processing and utilization of fine-grained coal and slime of Tkibuli-Shaori deposit. /R. Sturua, D. Talakhadze, Z. Arabidze, A. Abshilava, J. Kaphlanishvili, Z. Gordeziani/. Mining Journal. – 2009. – #1(22). – pp. 34-37. – geo.; abs.: eng., rus.

The paper deals with extraction, processing and the opportunities of use of fine-grained slime of the River Tkibula water basin during extraction and coal processing of the Tkibuli-Shaori deposit; a process flowsheet of dressing has been worked out and the appropriate outfit selected. As a result of the processing, a fine-grained fraction of coal is produced that can be used in thermal power plants, as well as for household purposes subject to preliminary bracketing.

Auth.

7.C4.17. Hydraulic analysis of the functioning of a new settling reservoir of quarry and underdump acid waters of Joint-Stock Company "Madneuli". /V. Silagadze, M. Jangidze, B. Menabdishvili, K. Kekelidze/. Mining Journal. – 2009. – #1(22). – pp. 54-57. – geo.; abs.: eng., rus.

For the purpose of rational control of quarry and under dump acid waters a hydraulic analysis of water intake and spillway systems of a new settling reservoir designed on their transport line has been carried out. The values of throughput of individual sections were established ensuring the safe throughput of maximum inflow of acid waters (Q_{max}=250m^3/hour) by these systems. The operating conditions of the settling reservoir are considered.

Auth.

7.C4.18. On the assessment of manufacturability of mining and geological conditions of coal deposits. /Y. Rekhviashvili, T. Pirtskhalava/. Mining Journal. – 2009. – #1(22). – pp. 58-60. – geo.; abs.: eng., rus.

The development of fuel and energy sector of Georgia in a market economy requires new approaches to solving the coal industry problems in terms of their market competitiveness. The approach to the evaluation of coal geological structures in terms of technological improvement of mining of their reserves by underground methods has been presented. It was found that Tkibuli-Shaori coal-producing region is characterized by very complex mining and geological conditions, comparable to the conditions of the complex deposits and basins of the leading coal-producing countries. The coefficient of the integral evaluation of manufacturability of the mining-geological conditions of the Shaori carboniferous area is almost four times less than that of the Ruhr, three times less than of the Donetsk and 35% less than that of Karaganda basin. The analysis allows using the best practices of Ruhr and other coal basins with highly complicated mining and geological conditions in the restructuring of the mines in the Shaori carboniferous area characterized by high levels of manufacturing concentration, the multiple growth of load on working face, safety and productivity.

Auth.

7.C4.19. On the choice of a type of exposive for concrete geological conditions. /V. Lortkipanidze/. Mining Journal. – 2009. – #1(22). – pp. 61-63. – geo.; abs.: eng., rus.

The basic characteristics of explosives influencing the rock destruction process are considered. Based on the advanced world practice, the most effective modern explosives and the areas of their use are determined.

Auth.

7.C4.20. The feasibility of the use of modern powered complexes in Tkibuli mines. /Y. Rekhviashvili, T. Pirtskhalava, M. Basiladze/. Mining Journal. – 2009. – #2(23). – pp. 21-27. – geo.; abs.: rus., eng.

The basic principle of restructuring of the coal industry, the practical realization of which is to transform the coal industry in a profitable one, provides for a sharp increase in the intensification and concentration of mining activities at the expense of creating necessary conditions for applying mechanical work and new technologies in mines. It is established that the coefficient of integral evaluation of adaptability of geological conditions of the Shaori coalfield is of almost two times less than that of Donetsk, 1.7-times less than that of Ruhr and 35% less than in Karaganda basin. A method of opening the balance reserves of Tkibuli-Shaori field by one slope with division of a minefield into blocks instead of four mines is proposed. Using this method will allow increasing productivity by 10-40%, reducing the length of supported roadways by 50%, the length of the path of fresh air ventilation - by 20%, the share of development workings - by 20% on the 1000 tons of production, and greatly simplifying the operation of underground transport.

Auth.

7.C4.21. Structures securing safe operation of dangerous sections of the Tskaltubo cave. /A. Abesadze, S. Demetrashvili, M. Abesadze/. Mining Journal. – 2009. – #2(23). – pp. 30-37. – geo.; abs.: rus., eng.

The current state of the walking paths being in an immediate vicinity to the ceiling rocks of the Tskaltubo cave is analyzed. Directions of spread of the existing cracks in the ceiling rocks as well as the locations of the naturally formed consoles the rock's layer are studied. Total 25 sections, which are considered dangerous for a safe operation of the cave are revealed at different stakes/marks. The metal-concrete

bearing structures are developed, providing the possibilities to preserve the conditions of natural balance in the immediate rocks of the ceiling. They will be constructed nearby the walking path, to perform the bearing function for the strata working on bending and to limit the formation and further development of cracks in local areas of the ceiling. The projects of building up the bearing metal-concrete structures are developed, on which basis the mining works are carried out in the tunnel. The “Merani“ LTD is engaged in these works.

Auth.

7.C4.22. Preliminary biotreatment of baritcontaining slimes on purpose of intensification of the process of flotation. /R. Kvatashidze, V. Totibadze, L. Kartvelishvili, N. Lomidze, J. Kakulia, Sh. Malashkhia/. Mining Journal. – 2009. – #2(23). – pp. 41-43. – geo.; abs.: rus., eng.

Preliminary bacterial treatment (processing) of slimes with a view to improve conditions of obtaining barite concentrates from barite-containing slimes with flotation has been carried out. Silicate bacteria (Bac. mucilaginosus) have been used. The content of barites in slimes as a result of bioleaching increased by 7% on average. In addition, the granulometric composition of slimes changed in the course of processing; in particular, as a result of partial decomposition of the 0,315+0,16 mm class particles, a new class, 0,16+0 mm, was formed, the yielding of which made 14%.

Auth.

7.C4.23. Study of the possibilities of using Tkibuli-Shaori mine coal for production of coal char. /S. Makharadze/. Mining Journal. – 2009. – #2(23). – pp. 44-47. – geo.; abs.: rus., eng.

The results of a study of the possibilities of using Tkibuli-Shaori mine washed coal for producing coal char are discussed. The test with a traveling-grate carbonizer was held in the Polish company ‘POLCHAR. During the test, the following parameters were defined for the input and output production: granulometric composition, moisture, ash content, volatiles, calorific value, ash chemical contents, and the percentage of chemical elements in the contents. As a result of the test, it was concluded that parameters are complying wit the requirements to those of char coal of Ferro-alloy production manufacturers. Therefore, the output production – char coal – is recommended for on masse usage under industrial conditions.

Auth.

7.C4.24. Current condition of Georgian mining enterprises and development trends. /E. Mataradze, T. Akhvlediani, A.Gurjidze/. Mining Journal. – 2010. – #1(24). – pp. 13-16. – geo.; abs.: rus., eng.

The difficulties being faced during transition to a market economy have affected the operation of mining enterprises in Georgia. In recent years, investors have shown an increased interest in the rehabilitation of mining enterprises and developing new deposits. The paper deals with the current problems faced by Georgian mining industries and analyze the sustainable development challenges of the mining industry in Georgia.

Auth.

7.C4.25. Establishment of natural depletion of brown coal-containing layers by adsorption of calorific composite substances after the example of some deposits. – 2010. – #1(24). – pp. 17-19. – geo.; abs.: rus., eng.

It has been established that in the case when coal-bearing rocks are represented by bentonite clays, coal undergoes significant alterations, for the bentonite clays, as a strong adsorbent, adsorb from the coal under conditions of natural humidity a part of organics (humic acids, gums, and other moving composite substances) thus depleting the coal, increasing its ash content, and accordingly decreasing its calorific capacity. In the given case, it is expedient to exploit the coal and “black” or organics-saturated rocks selectively. It has also been established that the organic-saturated “black” bentonite is an excellent organic and mineral fertilizer. At the same time, in the case of coal briquetting, it may be used as a bonding material for metallurgy.

Auth.

7.C4.26. Hydraulic stowing on mines Tkibuli-Shaori coal deposits. /V. Silagadze, L. Makharadze, M. Jangidze/. Mining Journal. – 2010. – #1(24). – pp. 28-30. – geo.; abs.: rus., eng.

A short review of development of a stowing worked-out area in the coal mines of Tkibuli is given. The stowage materials applied at various times in Tkibuli are characterized and the requirements to stowage materials are shown. The current state of coal mining in Tkibuli and the stowing operations are underlined. A need for a new approach to the selection of stowing technology and stowing materials is emphasized.

Auth.

7.C4.27. Problems of rational use of natural and man-caused underground structures. /L. Japaridze/. Mining Journal. – 2010. – #1(24). – pp. 31-34. – geo.; abs.: rus., eng.

An analysis of worldwide practice of designing and construction of underground structures is carried out. The intensive growth of volumes of multifunctional use of underground spaces is marked. At the same time, the number of accidents and significant over-expenditure of time and finance in the construction of t tunnels are observable even in the technologically advanced countries. One of the main reasons of the above is the poor

organization of design and accounting operations. G.Tsulukidze Mining Institute develops original methods of coping with the above problems.

Auth.

7.C4.28. Structures securing safe operation of the manmade tunnel in the Tskaltubo cave. /A. Abesadze, S. Demetrashvili, M. Abesadze/. Mining Journal. – 2010. – #1(24). – pp. 34-42. – rus.; abs.: geo., eng.
The current state of the manmade, long ago desolated and deformed tunnel connecting the Tskaltubo Karst cave with the land surface is analyzed. Conditions of the established natural balance in the area around the tunnel, without using fastening structures, ensure a preservation of the free space therein. However, in the course of operation, threats of different types will always exist. For liquidating such threats and preserving the current state of the rocks around the tunnel, the facing monolithic concrete, reinforced concrete and there alternative constructions are developed.

Auth.

7.C4.29. On the question of copper flotation process control. /R. Enageli, A. Shekiladze/. Mining Journal. – 2010. – #1(24). – pp. 58-59. – geo.; abs.: rus., eng.
The article discusses the process of flotation of copper ore layer as the object of autoimmunization. The load points, as well as transport delays caused by pulp movement through the concentrate and tails channel are determined. A combined technique of the process control is proposed, providing for automatic dosing of reagents in the main flotation according to distortions by the open system and regulation of the reagents by two closed systems.

Auth.

7.C4.30. Selection of drilling technique taking into account the rational composition of drilling solutions. /V. Khitarishvili, N. Machavariani/. Mining Journal. – 2010. – #1(24). – pp. 83-84. – rus.; abs.: rus., eng.
The investigations carried out for selection of the drilling technique parameters on prospecting boreholes with diamond crown bits using clayeyless polymer drilling muds on the Madneuli-Poladauri deposit are considered. In contrast to ordinary clay mortars, these muds make it possible to carry out the forced drilling practices, during which a significant rise in mechanical speed is observable.

Auth.

7.C4.31. The analysis of prospects of using the Tkibuli-Shaori deposit coal for production of cement. /S. Makharadze, Z. Sadunishvili/. Mining Journal. – 2010. – #1(24). – pp. 94-99. – geo.; abs.: rus., eng.
The results of a research of using the Tkibili-Shaori coal as the main fuel in Georgian cement industry (in Kaspi and Rustavi cement plants) are presented. Nowadays, in order to produce clinker for cement in above-mentioned plants rotary kilns, the Tkibuli-Shaori washed coal meal is used as main fuel being burnt by a brush flame method. The technological scheme of producing coal meal and feeding to rotary kilns is presented, which significantly decreased the cost of clinker (approximately by 30%) and conditions a proper economic effect. The content of coal used as fuel according to oxides, as well as its ash is shown.

Auth.

7.C4.32. Doping of thin films of thulium, praseodymium and neodymium sulfides. /K. Davitadze, T. Minashvili, G. Iluridze/. Nano Studies. - 2010 - №2. - pp. 95-97. - geo.; abs.: geo., eng.
Pure rare-earth-elements sesquialteral sulfides are useless in microelectronic devices. The present work deals with doping of such films. Namely, some dopants have been chosen and appropriate doping technologies have been elaborated. In no cases, the doping with lead or cadmium was found to form an additional phase.

Auth.

7.C4.33. Stimulated phenomena in glass doped with CdSe quantum dots. /G. Dekanozishvili, D. Driaev, T. Kalabegishvili, V. Kvatchadze/. Nano Studies. - 2010 - №2. - pp. 99-102. - eng.; abs.: geo., eng.
Thermo-stimulated luminescence (TSL) of glass samples doped with CdSe quantum dots (QDs) and irradiated with X-rays and UV light has been investigated. UV effect is negligible, whereas between TSL intensity and sample exposure time to X-rays there is linear correlation. Photoluminescence and its temperature quenching were studied by thermo-optical luminescence method.

Auth.

7.C4.34. Competitive nanotechnologies for nanoelectronics, piezoengineering, photocatalysis and composites particularly using electroless deposition. /T. Khoperia, T. Zedginidze/. Nano Studies. - 2010 - №2. – pp. 127-138. - eng.; abs.: geo., eng.
Electroless metallization technology which allowed replacing adequately Au and Ag with Ni − P or Ni − B alloys and simplifying significantly the metallization process was developed. The proposed patentable nanomethods for the first time allow one to produce nanochips and photomasks with nano-sized adjacent

elements by single optical UV photolithography. The proposed nanomethods are much more advantageous and simpler than other expensive and complicated methods such as e-beam, X-ray lithography or fabrication of nanoelements using light-phase-shift photomasks. The proposed methods of metallization are widely used in electronics**,** piezoengineering and instrument-making. As a result Au, Ag and Pd were replaced with the alloys of non-precious metals; usage of toxic substances was eliminated.

Auth.

7.C4.35 Conditions of maintenance of profitable operation of Tkibuli-Shaori deposit. /I.Rekhviashvili, Z. Gordeziani, T. Pirtskhalava, M. Basiladze, S. Makharadze/**.** Mining Journal. – 2010. – #2(25). – pp. 12-19. – rus.; abs.: geo.; eng.

It is shown that the process flowsheets used on Tkibuli-Shaori coalfield for drilling-in, preparation and mining of coal seams do not correspond to local mining and geological conditions. They are complicating and increasing the cost of operating fields, have contributed to the misconception about the alleged over-complexity of the geological conditions of the deposit. The length of extraction columns is less than 200 m, while that of the story - 35-40 m. In the case of a transfer of mines to the mechanized method of coal mining, the development of these extraction pillars will require no more than 10 days. The main time will be spent on auxiliary operations. The ratio of computer time will be so small that if you use a mechanical complex, the cost of coal will increase rather than decrease. A concept based on the intensive model of Tkibuli-Shaori deposit development has been worked out, where, in accordance with the mining and geological conditions, the issues of the effective support to the mechanized complex have been resolved, this being a main condition for increasing the concentration and intensification of mining operations, raising performance and reducing the cost of coal mining

Auth.

7.C4.36. Problems of Tkibuli-Shaori deposit development. /A. Mikeladze/**.** Mining Journal. – 2010. – #2(25). – pp. 20-25. – geo.; abs.: geo.; eng., rus.

The paper discusses geological conditions of Tkibuli-Shaori deposit. It is advised that the exploration work be renewed and supported with the necessary personnel and funds. The current and future demand for Tkibuli coal is defined. In order to ensure stability of coal mining in the region, it is recommended to analyze a possibility of development of existing mines through implementation of their adjusted projects. A critical analysis of the proposal by a group of researchers on replacement of the so-called “small” mines with a large mine with the annual capacity of 3-3.5 mln tons is given. It is recommended to replace the existing technologies of coal mining by more reliable alternatives and to create a LLC “Saknakhshiri”-based engineering research group (GIG-Group) for solving complex mining problems.

Auth.

7.C4.37. Definition of productivity of adventures in terms of resources conservation upon underground mining. /A.Kikabidze, G. Shatberashvili/**.** Mining Journal. – 2010. – #2(25). – pp. 26-27. – geo.; abs.: geo.; eng., rus.

The principal methods of determination of annual output of an adventure based on both mining facilities, and corresponding technical and economic calculations, also, on the existence of the adventure and the size of its resources are considered. Actually, on determination of annual extraction along with the economic and technological expediency, the social, ecological and the deposit conservation requirements are taken into account. Other things being equal, only the annual extraction rise makes it possible to develop the sites with poor oars. The article presents the methods of determination of an annual production rate of a mine by a comparative analysis, as well as enables to determine the boundary, after which the extraction of poor ores is inexpedient.

Auth.

7.C4.38. Determination of the minimum volume of reserves for estimation of technical and economic efficiency of mining of deposits. /A.Kikabidze, G. Shatberashvili/**.** Mining Journal. – 2010. – #2(25). – pp. 28-29. – geo.; abs.: geo.; eng., rus.

The transfer of mineral resources into a category of reserves (in the availability of sufficient data of geological prospecting) is possible only in the case when its quantity and quality meet the requirements of economic efficiency of mining, and is sufficient for payback of capital investments and gaining planned income. Therefore, the determination of the minimum reserves meeting the requirements of economic efficiency of their mining is rather urgent. At the same time, the existing methods of calculations are rather laborious and imperfect. In this article, we presented the technique of a calculation of the minimum volume of reserves for an estimation of technical and economic efficiency of the deposit mining.

Auth.

7.C4.39. Investigation of benefication of manganese tailings and slurry by magnetic method. /R. Enageli, M. Gamtsemlidze, M. Tutberidze, G.Javakhishvili/**.** Mining Journal. – 2010. – #2(25). – pp. 30-34. – geo.; abs.: geo.; eng., rus.

The article gives the results of beneficiation of stored waste (tailings and slurry) of Chiatura manganese ore processing. The obtained statistical data have been processed by the methods of mathematical statistics and optimization identification of technological processes of beneficiation. The basic relations of the process have been plotted, on the basis of which the beneficiation regime and range of technological parameters have been determined

Auth.

7.C4.40. Investigation and control of dressing process of the intermediate product of the manganese carbonate-based ore using magnetic method. /M. Gamtsemlidze, M. Tutberidze, A. Shekiladze, E. Rukhadze/**.** Mining Journal. – 2010. – #2(25). – pp. 35-38. – geo.; abs.: geo.; eng., rus.

The technological scheme of dressing of the intermediate product of the manganese carbonate-based ore using three-stage process of magnetic separation has been considered; perturbing values that affect on stratification of milling material, as well as the link between the basic parameters, acting on processes, and indicators of dressing have been established; corresponding graphs have been constructed; based on analysis of the value of controlled parameters which allow to extract the maximum manganese in the concentrate; the device of continuous measurement of these perturbing values has been developed; the technique of control process accordingly these values has been elaborated.

Auth.

7.C4.41. The analysis of amenity of plasma technologies in mining. /D. Gelenidze/**.** Mining Journal. – 2010. – #2(25). – pp. 44-50 – geo.; abs.: geo.; eng., rus.

Because of specificity of the mining industry (big capacities, limited space, heavy working conditions, etc) the amenity of plasma technologies in mining is complicated and seldom used. The purpose of this work is to consider the essence of such plasma technologies and the relevant work executed at the Georgian Technical University and Mining Institute.

Auth.

7.C4.42. Preparing of light cement solutions with addition of microsphere and their use for fulfilling bridging works in boreholes. /V. Khitarishvili, N. Machavariani, M. Asatiani/**.** Mining Journal. – 2010. – #2(25). – pp. 51-54. – geo.; abs.: geo.; eng., rus.

The peculiarities of the use of light cement solutions with the addition of glass, ceramic, polymer and other kinds of microspheres for cementing case pipes in boreholes are considered. It is noted that microspheres of different density and different stability to pressures in boreholes are manufactured and that the appropriate microspheric grouting mortar can be selected for different boreholes. The use of these mortars make it possible to decrease the material and time expenditures for borehole casing, also provides the lifting of the mortar to the required height and the separation of layers. The obtained cement clinker is distinguished by high strength and stability to cracking. Thus, it can be concluded that for the boreholes cementation in Georgia the microspheric grouting mortars can be used.

Auth.

7.C4.43. Preservation of natural structure in facing stone blocks made by blasting of explosive cord. /R. Mikhelson/**.** Mining Journal. – 2010. – #2(25). – pp. 65-68. – rus.; abs.: geo.; eng., rus.

Laboratory tests on decorative stone specimens produced by blasting block by means of explosive cord have been conducted. During testing, the following indirect methods for estimation of the stone structure were used: the definition of the propagation velocity of ultrasonic vibrations, the ultimate strength under compression and tension, as well as salt resistance of the specimens, taken at different distances from the plane of the split. An analysis of the data revealed that the width of the structural changes of stone, adjacent to the plane of the split, is 15-35 mm. Multiplicity of explosive loading of the same block does not lead to a decrease in slab output if the current value of the resistance index of rocks by the proposed method exceeds 75% of its nominal value. The ways to reduce the intensity of explosive loading at separation of blocks from the rock mass, ensuring preservation of the natural structure of stone in products, are recommended.

Auth.

7.C4.44. Results of a short-delay blasting test in underground mine opening of Chiatura Mining Company. /V. Lortkipanidze L. Khaduri, G. Tkhelidze/**.** Mining Journal. – 2010. – #2(25). – pp. 69-73. – geo.; abs.: geo.; eng., rus.

The cup-and-fuse blasting is the most dangerous method of initiation of the blasting charges and is characterized by low efficiency. However, the blasting of the charges is carried out exclusively by this method in the underground mine openings of Chiatura Mining Company. In order to improve blasting showings and further safety of drilling-and-blasting, an electrical short–delay blasting was tested in the underground mine openings of the mentioned company. The modern possibilities of electrical initiation of blasting charges are shown. The electric detonators of the ЭД-1-3-Т type characterized by reduced sensitivity to stray currents and charges of static electricity are chosen.

Auth.

7.C4.45. The calculation of safe distance to prevent a danger of charge detonation. /N. Bochorishvili, A. Neverov/**.** Mining Journal. – 2010. – #2(25). – pp. 82-83. – geo.; abs.: geo.; eng., rus.
The paper presents five criteria of danger, of which only the second is considered. It is the risk of transmission of detonation from one charge to another. The safety regulations provide only a minimum value of safe distances, which in most cases is insufficient and people can be severely injured. The attitudes presented in the work allow for an exact calculation of the safe distance and thereby for reducing the risk of injuries.

Auth.

7.C4.46. Some remarks on coal mining flow charts recommended in the Coal Mine Safety Regulations. /Al. Mikeladze/**.** Mining Journal. – 2010. – #2(25). – pp. 84-86. – geo.; abs.: geo.; eng., rus.
Critical remarks are given on coal mining flow charts which are recommended in the Coal Mine Safety Regulations. It is recommended the looking for and the introduction into production of special flow charts for mining coal seams at Tkibuli-Shaori become a special topic for research, without which effective operation of the deposit is impossible. Simultaneously, a special attention should be given to problems of ecology and protection of geological environment and surface objects of the region.

Auth.

C5. Mechanical Engineering. Instrument-Making

7.C5.1. Kinematic analysis of passenger car optimum brake linkage. /G. Sharashenidze, P. Kurtanidze, S. Sharashenidze, G. Usanetashvili, L. Kuparashvili/. Science and Technologies. – 2009. - #10-12. – pp. 65-72. – geo., abs.: eng., rus.
Based on the analytical geometry principles and mathematical analysis the functional dependences of hanger brackets of brake pads and the basic geometrical parameters of brake linkage are determined. The corresponding analytical expressions for angle of rotation of levers and angular speeds are obtained.

Auth.

7.C5.2. Methods of analog indicating scale image reading. /K. Chapidze, Dadunashvili, V. Demetrashvili/. Science and Technologies. – 2010. - #4-6. – pp. 35-38. – geo., abs.: eng., rus.
The article states that in the process of scale reading with the use of contact points of pixels in the image an error in determining the parameters and the actual position of the label and pointer of analog devices is significantly reduced.

Auth.

7.C5.3. Small-scale mechanization in sericulture. /I. Korchilava/. New Agrarian Georgia – 2010. - #6. – pp. 15-16. – geo., abs.: geo., eng.
The development and revival of sericulture by means of small-scale mechanization are considered. In particular, the design and process flowsheets of small-scale mechanization facilities – mulberry leaf (bud) strippers and lead-cutters are shown. For farming households are recommended simple types of feeding shelves for silkworm feeding with mulberry characterized of many positive attributes as compared with the existing ones.

Auth.

7.C5.4. Analysis and synthesis of traction dynamics of wheeled vehicles. /A. Geguchadze, T. Morchadze/. Science and Technologies. – 2010. - #7-9. – pp. 62-66. – geo., abs.: eng., rus.
For the purpose of decreasing energy expenses on the deformation of tires upon their unstable contact with the surface, the authors propose using for driving-wheels of mobile vehicles various annular elastic units as elastic muffs (for example, elastic muffs for all-wheel drive mini tractor) or energy-conversion wheels (for example, with annular elastic elements for a vehicle) as accumulators of torque energy and its return to the power drive.

Auth.

7.C5.5. Development of a piezoelectric sensor of seismo-vibration acceleration. /B. Mamikonyan, S. Karapentyan, V. Muradyan/. Georgian Scientific News. – 2010. - #1(5). – pp. 34-45. – rus., abs.: geo., eng., rus.
A seismic-vibration acceleration sensor in the range of frequencies 0.2 Hz through 50Hz is developed. Two disks made of piezoceramic material – ЦТС-19 connected sequentially and abidingly are used as a sensitive element. Structural schema of the measuring system and sensor construction are described, the technique, the applied equipment and experimental research results are presented. Basic metrological characteristics are defined.

Auth.

7.C5.6. Spiral separator device and control method. /M. Gamtsemlidze, N. Samkharadze, G. Chqareuli/. Mining Journal. – 2009. – #2(23). – pp. 38-40. – geo.; abs.: rus., eng.
A spiral separator device, in which by strengthening of centrifugal force and vertical oscillations of whole spiral separator the increasing of effectiveness of purification and extracting of minerals into concentrate product is possible, is proposed. The process control method used for changing the volume of centrifugal force and vertical oscillations for optimal control of specified process, with consideration of disturbing volumes (such as value of feed and rock mass grade), is developed.

Auth.

7.C5.7. Theoretical and experimental study of a trenching machine. /V. Samkharadze/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 209-214. – geo., abs.: geo., eng., rus.
The paper describes the results of theoretical and experimental study concerning a trenching machine. The study aims at determining dependence between the geometrical properties of a cone-shaped trenching machine and soil properties: moisture, density and adhesive capacity of soil particles on the surface of working body. Optimal parameters of slope gradient are given.

Auth.

C6. Light Industry

7.C6.1. Old Georgian ornament in modern clothes. /Z. Vadachkoria/. Science and Technologies. – 2009. - #10-12. – pp. 105-108. – geo., abs.: eng., rus.
The subject matter of the article is the history of Georgian national folk weaving production. It is shown how important is the revival of Georgian national handicraft and its introduction into the present. The purpose of the article is to combine the old and new and manifest in Georgian national clothes in compliance with the modern fashion requirements.

Auth.

7.C6.2. Strength research of conjunctive stitch lines of immovable multilayer fabric sheaths. /M. Datuashvili, I. Charkviani, I. Ugrekhelidze/. Georgian Scientific News. – 2010. - #1(5). – pp. 54-56. – rus., abs.: geo., eng., rus.
The article concerns the questions of increasing performance of composite materials on the basis of textile reinforced skeletons. The basic attention is given to the lack of layered composites which are revealed in weak resistance between interlaminar shift and cross section separation. Based on the problem, a device and technique determining the strength indicator of conjunctive stitch line of fabric sheath are developed. By considering the obtained results for sewing dome-shaped reinforced multilayered sheets, the use of geodetic parallels and inter perpendicular sections are recommended

Auth.

7.C6.3. Development of textile products. /Z. Vadachkoria, E. Buadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 401-402. – rus.; abs.: geo., eng.
The presented surveys the various stages of development of textile products and their dependences. Also, it shows what kind of work the department of Textile Technology and Design of Akaki Tsereteli State University is performing in this direction. In particular, the work in the direction of obtaining new kinds of hooks, developing textile for clothing, and developing medical stockinet and surgical suture.

Auth.

7.C6.4. Investigation of α -relaxation transfer of linear and structured thermoplasts for shoes. /M. Shalamberidze, N. Lomtadze, M. Grdzelidze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 411-413. – rus.; abs.: geo., eng.
The α-relaxation transfer of linear and structured thermoplasts ДСТ-30 and sybelene by using various hardeners has been investigated. The thermoplasts are found to have on the base of latent hardeners better elastic properties against the sulfur vulcanizates of corresponding polymers.

Auth.

C7. Food Industry

7.C7.1. Study of antagonistic activity in the Adjarian (Khetsubani and Kapreshumi) natural populations of wine yeast. /M. Menabde, J. Chitanava, A. Shatirishvili/. Science and Technologies**. –** 2009. - #10-12. – pp. 19-22. – geo., abs.: eng., rus.
Antagonistic activities have been studied in strains isolated from the Adjarian (Khetsubani and Kapreshumi) natural populations of wine yeast. The populations were obtained from small farm wineries. Wine production occurs by spontaneous fermentation of grape juice in such wineries. K, N and S phenotypic strains were revealed in the studied populations of wine yeast. The populations were found to be similar in structure.

Auth.

7.C7.2. The usage of red organic dye made from elder in the liqueur recipe. /L. Akhlouri, M. Khomasuridze, G. Datukishvili/. Science and Technologies. – 2009. - #10-12. – pp. 109-111. – geo., abs.: eng., rus.
The experimental was arranged to receive red organic dye in the form of extract. The mass concentration of dye compounds was 40g/kg. The produced dye was used to prepare a blackberry liquor of different dosage in order to estimate the optimal dosage. The analytical parameters of the above-mentioned liquor were: ethanol 25 vol.%; the mass concentration of titric acids – 6,1g/l; the mass concentration of extract 42g/l. The trial was examined for turbidity. Based on the conducted analysis, the optimal dosage of red organic dye made from an elder for blackberry liquor is 5g/l.

Auth.

7.C7.3. A new plant dye used in food industry. /G. Gvaladze/. Science and Technologies. – 2010. - #4-6. – pp. 61-64. – geo., abs.: eng., rus.
The beet (*Beta vulgros* L.) contains many bio-active substances, including iodine, magnum, and painting substances. The beet basically is applied in cookery for coloring food. The industrial use of beet is limited. Since the beet contains magnum and a coloring substance (betanidin) of bright red color, we investigated the technological properties of the raw material of beet and concluded that beet is one of the best raw materials for manufacturing red-color dyes. In addition, it can be successfully used in the making of alcoholic and soft beverages.

Auth.

7.C7.4. Computeraized experiment of storing of vegetable products. /S. Tevdoradze/. Science and Technologies. – 2010. - #7-9. – pp. 92-96. – geo., abs.: eng., rus.
By applying the methods of mathematical simulation, the influence on the storage of vegetable products in the regulated gas medium with active ventilation of the external parameters of the inlet composition, inlet temperature, gas medium rate of movement, etc. is investigated. The complex and interdependent nature of the influence of these parameters on the storage quality characteristics makes it necessary to state and resolve an optimization problem for definition of their rational values.

Auth.

7.C7.5. Rational technology of processing oil-bearing rose flowers. /N. Baghaturia, L. Qajaia, R. Bziava, M. Demeniuk/. Agrarian-Economic Science and Technologies. – 2010. – #4. – pp. 45-49. – geo.; abs.:geo.; eng.
The purpose of the study is to work out such rose flower processing technology that would make it possible to increase the content of essential oil in the rose flowers, avoid production waste and protect thus the environment, produce the essential-oil-enriched rose water, and make rose jam. The entire new technology consists of three technological processes. The first one produces a rose jam and rose distillate enriched with essential oil. The second one utilizes the waste produced from the first process to make a rose distillate. The third one produces rose water for perfumery purposes. The physico-chemical characteristics of the rose water and rose jam are established. Based on them, an entrepreneur' standard and rose flower processing instructions and relevant documents have been developed.

Auth.

7.C7.6. Development of a new assortment of nonalcoholic drinks for diabetics. /T. Nanitashvili, L. Qutateladze/. Agrarian-Economic Science and Technologies. – 2010. – #4. – pp. 50-54. – geo.; abs.:geo.; eng.
Developed from sugar-containing topinambur (also known as Jerusalem artichoke) in compliance with all necessary requirements: is devoid of specific smell, color and taste. For the purpose, all properties of topinambur have been studied; instructions on its harvesting and storage as well as an entrepreneur's standard for topinambur-based diabetic soft drinks have been worked out.

Auth.

7.C7.7. Making yellow coloring from saffron's flowers. /L. Qutateladze, M. Demeniuk, L. Ejibia/. Agrarian-Economic Science and Technologies. – 2010. – #4. – pp. 55-57. – geo.; abs.:geo.; eng.
Food colorings make products attractive to the eye and enhance their natural color. The processes of this natural food coloring extraction are studied. The physico-chemical characteristics of both the dry saffron flower and the coloring proper are given. A process technology for making natural yellow dye and the appropriate technical specifications are worked out.

Auth.

7.C7.8. The research and utilization of some stone-fruits' processing residual stock. /L. Mujiri, M. Ormotsadze, E. Kalatozishvili, E. Uturashvili, N. Iluridze/. Agrarian-Economic Science and Technologies. – 2010. – #4. – pp. 58-62. – geo.; abs.:geo.; eng.

Based on the conducted research, the physico-chemical characteristics and the adsorption properties of stones and rind of different peach varieties have been studied. An analysis of the produced alcohol demonstarted that the peach stone is characterized of best adsotption properties and can be used for refinement of ethyl alchohol. It is not toxic and costly. The utilization of peach rind was found to reduce the number of aldehydes to 4.0-3.9 mg/dm^3. The proposed technology and technical specifications provide for utilization of peach rind for rectifying ethyl alcohol and producing an ecologically safe product.

Auth.

7.C7.9. The improvement of fruit-berry raw material processing technology by control of biochemical processes. /L. Mujiri, M. Ormotsadze, E. Kalatozishvili/. Agrarian-Economic Science and Technologies. – 2010. – #4. – pp. 63-65. – geo.; abs.: geo.; eng.
The experiment aimed at researching the physical-chemical parameters of fruit–berry raw materials. According to obtained results, the perspective varieties of the above-mentioned raw materials were selected. In addition, based on technological properties, the best varieties for the processing industry were selected to make such products as dried fruits, churchkhelas, jams, fruit jellies, marmalades, etc.

Auth.

7.C7.10. Optimization of the drying process of hips. /N. Alkhanashvili/**.** Agrarian-Economic Science and Technologies. – 2010. – #4. – pp. 66-68. – geo.; abs.: geo.; eng.
A technology of artificial drying of hips, including preparation of hips for drying, drying, inspection, sorting out and packing of dried fruits has been developed. In order to determine the optimal mode of drying of hips, the effect of the heat-carrying agent's temperature, speed of movement and the specific load of the dryer on drying kinetics and the quality of the ready products were studied. A long keeping of hips in the drier at 80-100° temperature adversely affects their chemical and organoleptic characteristics, which is conditioned by redox ferment reactions ongoing in crude fruits under condition of high initial humidity of fruits (60-66%). Because of the above, a 5-stage drying mode on five-band conveyer drying device was chosen, with a gradual reduction of the heat carrying agent's temperature from 80-85° (the first stage, the first conveyer) to 30-40° (the fifth stage, the fifth conveyer). Such temperature mode provides for reduction of humidity of hips from 60-66% (the first stage) to 10-15% (the fifth stage). The results of testing were processed by generation of drying-temperature curves, the latter making possible to establish optimal parameters of the five-stage mode of drying of hips according to the stages.

Auth.

7.C7.11. On drying vegetables on farms /N. Alkhanashvili/**.** Agrarian-Economic Science and Technologies. – 2010. – #4. – pp. 69-73. – geo.; abs.: geo.; eng.
A raw vegetable drying technology directly on farms was elaborated and the relevant equipment was chosen. Five-band conveyer type dryers with regulation of a heat-carrier's temperature according to stages were selected for the purpose. These drying devices are characterized of high sanitary-hygienic conditions, with high level of automation, and less energy expense. They differ in performance and dimensions; work on different kind of fuel, which enables farmers to choose an accessible energy source, the desired performance and cost of drying devices. Where necessary, 2-4 territorially closely located farms may use one drying shop for complete processing of the raw material produced in the farm. Widely cultivated on farms vegetables – cabbage and beetroot – were chosen as the subjects of research and the optimal drying modes were established for them.

Auth.

7.C7.12. Foundation of beer production in Tbilisi. /T. Paichadze/**.** Gaenati Herald. – 2010. – v. 3, #3. – pp. 26-35. – geo.; abs.: geo.; eng., rus.
The work considers the basic issues of foundation and development of industrial production of beer in Tbilisi. The dynamics of beer-making, which due to low price and high quality used to compete with wine-making, but then lowered it quality and increased in price, are shown. Beer brewing in Georgia started by German colonists who settled in Tbilisi in the early 19th century and founded industrial brewing from the 30s.

Auth.

C8. Construction. Architecture

7.C8.1. Theoretical calculation of the fire-resistance limit of some fencing building constructions. /G. Abashidze/. Science and Technologies. – 2010. - #4-6. – pp. 69-74. – geo., abs.: eng., rus.
The examples of theoretical determination of fire-resistance limit of building constructions walls, partitions are given, erected from: a) red brick of 12 cm thickness; b) concrete blocks (δ=20 cm); c) concrete hollow blocks (δ=30 cm); d) foamed concrete blocks (δ=20 cm). Fire-resistance limit was estimated by II limiting state-heat insulation capacity of the construction. The calculation is based on the Schmidt method of finite differences. It is shown that the limit of fire-resistance for all above-mentioned types of the constructions of indicated thickness is more than 90 min. The proposed method for calculation of the fire-resistance limit of fencing

construction is recommended for designing of building and structures as well as for performing of expert works for estimation of fire safety of building objects.

Auth.

7.C8.2. The economic aspects of geological and ecological conditions for construction of a terminal. /T. Tevzadze, M. Vartanov, D. Potskhveria, V. Shurgaia/. Science and Technologies. – 2010. - #4-6. – pp. 75-78. – geo., abs.: eng., rus.
The article highlights the main geological and ecological conditions for construction of a deep-sea terminal in the region of the estuary of river Chorokhi. The article also refers to the economical aspects and the methodology for evaluation of efficiency of this kind of construction, as well as to the role of development of infrastructure and the increase of the geopolitical factor of the country.

Auth.

7.C8.3. Contemporary technologies of the asphalt-concrete pavement restoration and calculation of power of the basic milling operating unit. /M. Baratashvili/. Science and Technologies. – 2010. - #4-6. – pp. 79-84. – geo., abs.: eng., rus.
The article considers contemporary technologies of the asphalt-concrete pavement restoration and dependence of application of these technologies on the state of the roadbed and pavement destruction degree; and also presents the fundamental dependence of geometric and speed characteristics of the milling operating unit's power consumption.

Auth.

7.C8.4. The use of deluvium clay shales of special-purpose in building materials. /G. Kukuladze, F. Bezhanov, Sh.Malashkhia, N. Sarjveladze/. Mining Journal. – 2009. – #2(23). – pp. 28-30. – geo.; abs.: rus., eng.
The results of the use of diluvium of Duruji Valley (Kvareli) as a raw material for production of foam concrete are presented. The physical-mechanical properties were established for test specimens of foam concretes, prepared by integrated production technology and by means of fillers (sand) mined from various deposits of Georgia. The obtained results permit to use the fillers of Duruji Valley in the lightweight concrete production technology.

Auth.

7.C8.5. Concrete class and grade; comparison of American and Russian concrete strength determination standards. /G. Baliashvili, R. Samadashvili, T. Rukhadze, Z. Gaganidze, N. Sarjveladze, M. Eloshvili, I. Gogolauri/. Mining Journal. – 2010. – #1(24). – pp. 49-54. – rus.; abs.: geo., eng.
The article gives dependences between strengths of cylindrical and cubic-shaped concrete samples; class (C, B) and mark (M) at strength; difference of strength between samples drilled vertically and of different humidity. A difference and analysis between the American and Russian standards of concrete strength are given.

Auth.

7.C8.6. Explosive demolition of buildigs in densely populated areas. /N. Kukuladze, S. Khomeriki, Z. Kuchukhidze, A. Apriashvili, G. Bakhutashvili, L. Khaduri, G. Tkhelidze/. Mining Journal. – 2010. – #1(24). – pp. 65-68. – rus.; abs.: geo., eng.
The article provides parameters of the drilling and blasting operations to secure explosive demolition of a building in a preliminary fixed direction, as well as the nature of the effect of seismic waves and air blow generated by the blast on the protected objects and the safe zones.

Auth.

7.C8.7. Tradition in the works of 20th century Japanese architects. /M. Davitaia/. Newsletters of Academy of Education Science of Georgia. – 2010. - # 1(16). – pp. 209-212. – geo., abs.: rus., eng.
The article deals with the tendency of modern Japanese architecture to preserve ancient traditions and principles after the examples of the works of Kenzo Tange and Kengo Kuma, the architects of two different generations in the 20th century.

M. Kopaleishvili

C9. Agriculture and Forestry. Fishery

7.C9.1. Prediction of apple fruit storage. /Z. Shapatava, M. Zhgenti, K. Dzeria, M. Makhatadze/. GEN. – 2010. - #1. - pp. 106-108. - eng.; abs.: rus.
A relation between the content of calcium in apples and their dynamic diseases is discussed. Two apple cultivars, *Liberty* and *Golden Smooth*, were studied. In the *Liberty* apples, the tissue around the pericarp is susceptible to browning during storage, whereas the *Golden Smooth* cultivar is not damaged by dynamic diseases during storage. The content of calcium was high in both cultivars: 9.0-13.8 mg/100g in the *Golden*

Smooth apples and 8.4-11.6 mg/100g in the Liberty apples. In the *Liberty* apples, the tissue around the pericarp turned brown after storage for 1-1.5 months, when the content of Ca was less than 9.0 mg/100g and after storage for 3-4 months, when the content of calcium was more than 9.0 mg/100g. The quantity of titratable acidity decreased in both cases. It is shown that the development of disease and hence the storage life of apples can be predicted by the content of calcium and the cultivar properties. The role of calcium in the development of dynamic diseases is not confined to its quantitative parameter; no less important is its stabilization in the protopectin molecule and the percentage of calcium compounds. In the apples of *Liberty* cultivar, the process of ripening proceeds quite intensely. After releasing calcium, the wall of the cell is damaged, and the conditions for development of the disease are formed.

Auth.

7.C9.2. Effects of preprocessing on the quality of dried plums. /Z. Shapatava, K. Dzeria, M. Zhgenti, N. Melanashvili/. GEN. – 2010. - #1. - pp. 109-112. - eng.; abs.: rus.
The article deals with the effect of preprocessing on the dried plum quality. Five plum varieties were examined, namely Italian, D'Agen, Catherine, Shavkliava and Stanley. The content of protopectin, cutinic acid, epicuticular and cuticular waxes in the plum exocarp was identified. Based on the obtained data, the optimal blanching conditions (caustic soda concentration and exposition time) were determined.

Auth.

7.C9.3. The influence of potassium deficiency on the metabolism of grapes and wine quality. /O. Tsitsilashvili, M.Vibliani, T.Asashvili, T.Khositashvili, L.Tsiklauri, N.Kandelaki/. GEN. – 2010. - #1. - pp. 117-119.; eng.; abs.: rus.
The effect of potassium deficiency on the metabolism of grapevine was studied. For creating the K deficiency, grapevine cuttings were washed from mineral elements by passing through them a lot of distilled water under pressure. After rooting, the shoots were placed in nutrient solutions containing potassium or without it. It was established that the K deficiency inhibited the growth of roots by 50-60% and of the overground mass – by 40-50%. Some aspects of the effect of K deficiency in the grape vine on the quality of grapes and wine were considered.

Auth.

7.C9.4. Testing virus free potato clones. /G. Bolgashvili, A. Zubiashvili/. Science and Technologies. – 2009. - #10-12. – pp. 112-114. – geo., abs.: eng., rus.
Georgia can be considered a potato-growing good country in terms of its climatic conditions. Also, it is very important that to obtain high yield and high quality seed material. 6 new clones introduced from CIP at the Research Institute of Farming were tested. The said clones were normally developed, without being infested. The clone #6 demonstrated the best conditions. The number of tubers per plant made on general 47. The clone corresponded to a type of medium-late maturity period.

Auth.

7.C9.5. Wild chickpea in Georgia. /A. Zubiashvili, A. Gulbani, A. Devidze, T. Akhaladze, N. Rukhyan/. Science and Technologies. – 2009. - #10-12. – pp. 115-118. – geo., abs.: eng., rus.
Among legume crops, chickpea is one of the most important ones. This notwithstanding, the areas under in the country are very small. The chickpea is very important for our country in terms of drought resistance; it is reach in proteins and grows in the areas where beans do not grow. Different collection trips were arranged in different country regions by the PGR Unit staff at the RI of Farming with the financial support of the Georgia National Science foundation (GNSF) and International Center for Agricultural Research in the Dryland Areas (ICARDA). The goal of the collection missions was to find the wild chickpea (*Cicer incisum* (Wild), and *Cicer caucasicum* Bornm), which had been found long ago by the staff of the Institute of Botany, in 1909 and 1939, in Gori district (Ateni gorge). *Cicer caucasicum* is endemic to Georgia. In August 2007, during the collection mission *Cicer incisum* was been found by the PGR Unit staff in Gori district, in left side of rocky slopes in Ateni gorge. There were several populations of the plant, of which the seeds and herbarium specimens were collected. The said material is considering being very important and valuable germplasm for future breeding programs.

Auth.

7.C9.6. The keeping quality of the apple fruits after treatment by calcium. /T. Khokhobashvili/. Science and Technologies. – 2010. - #4-6. – pp. 29-31. – geo., abs.: eng., rus.
The article investigates the keeping quality of the apple fruits after treatment by 2% calcium chloride. The investigation result demonstrated an increased resistance to physiological and fungus diseases in the apples *Sinapi* and *Kekhura* treated by calcium.

Auth.

7.C9.7. Methods of assessing the volume of tractor work in plant growing. /O. Karchava, Z. Bregvadze/. Agrarian Georgia – 2010. - #6. – pp. 21-23. – geo., abs.: geo., eng.

The existing methods of assessing the tractor work volume in plant growing does not take into account such working conditions as sloping of the ground areas at big heights above sea level, their relief and forms. The article states provides methods enabling real assessment of the actual volume of agricultural works taking into account the above-stated working conditions. The methods have been tested under specific working conditions and are found to be suitable for employment in practice.

Auth.

7.C9.8. Study of fitohelmints discovered in nematodefauna of the vineyard soil. /N. Tsibadze/. Georgian Scientific News. – 2010. - #1(5). – pp. 15-17. – rus., abs.: geo., eng., rus.
Sample materials for studying phytohelminths in nematode fauna of the vineyard soil were taken for 2 years from 8 Imereti regions. The investigation showed that the following phytohelminth groups had been discovered in the nematode fauna of the vineyard soil: *Tylenchida, Aphelenhida, Dorylainida*. However, the virus carrier nematodes from *Xiphinema* series (*Longidoridae* family) are particularly dangerous. 5 representatives of this series are discovered, which evidences the potential danger for causing vine virus diseases.

Auth.

7.C9.9. Protein-rich forage production technology and Dolichos bean. /I. Sarjveladze, J. Jincharadze, N. Mikava, M. Sarjveladze/. Agrarian-Economic Science and Technologies. – 2010. – #4. – pp. 32-34. – geo.; abs.:geo.; eng.
One of the main pre-conditions of animal husbandry profitability growth and cost price reduction is the feeding of animals with protein-rich forage. For receiving balanced forage, the best opportunity is the sowing legume crops on arable lands, including Dolichos bean. The homeland of the crop is the eastern part of mountainous Africa. It is used as a forage crop and green silage. Seeds are rich in protein (28%) and carbohydrates (60%), fats (6.1%). The content of protein in the green mass makes 13.2-20%, that of potassium – 1. 5-2.6%. The crop is a short-day plant. The stalk is semiconvex and branched; it is better to be sow together with corn, sorghum, and sunflower.

Auth.

7.C9.10. Elaboration of agrotechnology of cowpea (blackeyed pea) (*Vigna sinensis* End) crop for humid subtropical zone of Georgia. /J. Jincharadze, I. Sarjveladze, N. Mikava, K. Peradze/. Agrarian-Economic Science and Technologies. – 2010. – #4. – pp. 36-39. – geo.; abs.:geo.; eng.
In the subtropical zone of West Georgia, with the establishment of firm forage base in animal husbandry, great attention is paid to the cultivation of protein-rich legume crops, which significantly increases efficiency of the sector and improves fertility of soil. The article gives a botanical-farming characterization of this productive food legume crop of cowpea. The prospects of the crop as forage in the subtropical zone are shown. Discussed are issues of the crop yield of green mass for silage and seeds, also the qualitative indicators of the obtained production. The crop yield is compared to certified legume crop of soya beans in this zone. The experimental data show that the yield of soya silage mass is 145.3 c/ha, while that of cowpea - 215.7c/ha, which by 70.7 c or 48% exceeds the soya yield. As for the seed yield of cowpea, they were not less than that of soya – 15, 9 c/ha.

Auth.

7.C9.11. Philant (beewolf) — the bee-hunter. /D. Baliashvili, N. Gardava/**.** Agrarian-Economic Science and Technologies. – 2010. – #4. – pp. 80-82. – geo.; abs.: geo.; eng.
Beewolves (genus Philanthus), also known as bee-hunters, are burrowing wasps, most of each prey on bees. The predatory wasps attack foraging bees and beehive bees and kill them. A habitat of the philant is areas of big apiaries, where it quickly propagates and harms beekeeping. On an apiary of the Research Institute of Beekeeping, in Okrokana, Tbilisi, for the first time in Georgia the insect's behavior was observed and studies because the current year's dry and hot weather conditions contributed to the propagation of this predatory wasp. To fight philants is rather difficult as they use to dig tunnels in the ground for nesting.

Auth.

7.C9.12. Problems of cattle breeding development and the ways of their solving in Samtskhe-Javakheti. /G. Gvelesiani, M. Okromelidze/**.** Agrarian-Economic Science and Technologies. – 2010. – #3. – pp. 18-21. – geo.; abs.: geo.; eng.
The article, on the basis of statistical data of 2000-2008, surveys the current situation existing in cattle breeding. An analysis of the areas sown to forage crops, their productivity and dynamics of production is made. The quantitative data and structure of cattle, the sector's efficiency and production level are also given. The problems in the sector and the ways of their solving are identified.

Auth.

7.C9.13. Prospects of industrially based poultry development in Kvemo Kartli region. /L. Kamarauli/**.** Agrarian-Economic Science and Technologies. – 2010. – #3. – pp. 22-26. – geo.; abs.:geo.; eng.
The article deals with the historical review of poultry development on an industrial base. It is proven that the

supply of local population with eggs and chicken meat, as well as the provision of markets with these products is possible only with the building and development of poultry farms. The article also deals with the estimation of industrial and economic indices of poultry farms in Kvemo Kartli region. The investigations prove that the indices of eggs production in two poultry farms “Dila” and “Savaneti” are different. The first farm, with 205 thousand heads, or 77% more layers than the second farm, obtains 10 eggs more per layer, and the cost of 10 eggs is less by 12 tetri, whereas the profitability level is higher.

Auth.

7.C9.14. Use of tomato dry remains in broiler’s feeding. /T. Pirtskhalaishvili, M. Kurashvili, V. Klibadze, M. Tsomaia, K. Jikia/. Agrarian-Economic Science and Technologies. – 2010. – #3. – pp. 31-36. – geo.; abs.: geo.; eng.
The article examines the results of use of production remains - dry pressed tomato skins – in broiler’s feeding. By studying physical qualities of tomato remains and conducting zootechnical and chemical analysis. It was ascertained that it satisfies the main requirements of preparatory component (ingredient) of combined feed and represents an important reserve for manufacture of the poultry combined feed. By use as poultry feed it was ascertained that 5% dry tomato remains in the broiler’s diet improves its zootechnical index, namely, live weight grows by 10.6%, pigmentation of the carcass’s skin – by 55-61%. Also improved is the uptake of nutrients from the feed, without causing pathology of the internal organs.

Auth.

7.C9.15. A comparative assessment of economic efficiency of high and traditional potato cultivation machinery. /O. Karchava, M. Zarqua/. Agrarian-Economic Science and Technologies. – 2010. – #3. – pp. 37-41. – geo.; abs.: geo.; eng.
An important share of agricultural produce, namely of potato, is currently imported because of low competitiveness of locally produced farm products. The main reason of the above is the application of outdated machinery and farming practices. The paper substantiates the efficiency of employing high-tech machinery in plant cultivation after the example of potato growing. Considered is a potato cultivation technological adapter developed for the subalpine zone of Samtskhe-Javakheti region and the favorable statistic of its application are given.

Auth.

7.C9.16. Possibilities of utilization of mineral resources of Georgia in the production of necessary fertilizers for agriculture. /R. Kvatashidze, Sh. Malashkhia, J. Kakulia, G. Kukuladze, V. Totibadze, N. Lomidze, L. Kartvelishvili/. Mining Journal. – 2009. – #2(23). – pp. 9-11. – geo.; abs.: rus., eng.
The possibilities of using mineral resources of Georgia for the production of required fertilizers to meet the needs of agriculture are considered; a possibility of using waste coal production and low-quality coal for the production of complex biological fertilizers is considered; a brief description of main deposits of phosphates and potassium-containing minerals (trachytes, glauconite) and the possibilities of obtaining on their basis of phosphate, potash and compound fertilizers with the use of biotechnology are given.

Auth.

7.C9.17. On the development of poultry keeping in Georgia. /T. Pirtskhalaishvili, V. Klibadze, M. Kurashvili/**.** Agrarian-Economic Science and Technologies. – 2010. – #2. – pp. 23-27. – geo.; abs.: geo.; eng.
The article examines the state of development of poultry keeping in Georgia for the last 20-25 years, including the sector privatization and its results. The indicators of revival of the poultry keeping sector during the last 5-6 years are presented, in particular of such branches as egg and meat production. The article also provides the result of recent studied carried out in the field, focusing on the importance of setting up poultry farms based on poultry of local breeds and indicating the demand of the local population for poultry products.

Auth.

7.C9.18. Silage crops for farms of East Georgia. /I. Sarjveladze, A. Korakhashvili, I. Vepkhvadze, N. Chankvetadze/**.** Agrarian-Economic Science and Technologies. – 2010. – #2. – pp. 29-34. – geo.; abs.: geo.; eng.
The issues of creation of a stable feed base for animal farming are considered. Attention is paid to the production of quality silage in ensuring profitable animal husbandry. The favourable traits of silage are considered, such as its ability to assist animals in digestion of fodder, improve the appetite, etc. In addition, its use will reduce the consumption of costly combined feed and positively affect the cost of animal keeping and of final product.

Auth.

7.C9.19. On the establishment of production standards of Georgian grey mountain bee. /A. Kordzakhia, I. Mumladze, G. Madzgarashvili, B. Tsitlidze, T. Bostashvili/**.** Agrarian-Economic Science and Technologies. – 2010. – #2. – pp. 63-66. – geo.; abs.: geo.; eng.

The Georgian bee is known for its perfect economical and biological traits, the evidence of which are the three gold medals awarded to the Georgian bee at the World Beekeeping Congress (Germany-1961; Romania-1965; USSR- 1971). In spite of such positive traits, no science-based industry standard of the Georgian bee, its swarming, queen bee, honey, wax, and propolis has been developed. The main aim of this study is to develop such national standards, which will greatly promote the Georgian beekeeping products on local and foreign markets.

Auth.

7.C9.20. Measures against varoatosis and acarapidosis in honey bees. /T. Tivishvili, N. Kipiani, D. Baliashvili, T. Matnadze/**.** Agrarian-Economic Science and Technologies. – 2010. – #2. – pp. 68-72. – geo.; abs.: geo.; eng.
The article deals with the continuation of a study of the epizootic situation concerning acarapidosis that was initiated in 2008 and encompassed the apiaries of Sagarejo, Sartichala, Sighnaghi, Lagodekhi, and Akhmeta districts. The article considers in detail the research methods used, the collected test material, and the measures to fight the disease, citing a rich literary material on the subject.

Auth.

7.C9.21. Sainfoin as honeybee feed. /L. Baliashvili, N. Chopikasvhili/**.** Agrarian-Economic Science and Technologies. – 2010. – #2. – pp. 74-76. – geo.; abs.: geo.; eng.
Sainfoin is the best honey plant. The height of its stem is 70-110 cm. Its root system is well developed and plentifully covered with calluses by which it enriches the soil with bacteria. It is less demanding to the soil. Its flowers are of thick, rosy color. The lifetime of a flower is 2-3 days. One sainfoin flower gives 2.2 to 4.9 milligrams of nectar with 39-45% of sugar content. On average, 1 ha of sainfoin-planted area gives up to 800-1200 kg of seeds, 80 to 170 kg of honey, 30-35 centners of hay. The honey productivity and amount of flowers of cultivated sainfoin exceed that of wild plant. 3-4 bee families will suffice to pollinate 1 ha area under sainfoin. It is desirable that more areas would be planted to sainfoin for the development of cattle-breeding and beekeeping in East Georgia.

Auth.

7.C9.22. The former and current forms of wood-use permits. /L. Zedginidze, A. Zedginidze/**.** Agrarian-Economic Science and Technologies. – 2010. – #2. – pp. 84-86. – geo.; abs.: geo.; eng.
The paper deals with the forms of permits to use wood resources in the former Soviet Georgia and under the current conditions of a market economy. One of the major legal documents was a wood cutting ticket (order) issued by forestry authorities. The document contained all the requirements to be met both by the owner of the forest and its user. The paper also describes the current forms of wood-use permits, the rules for applying for a user permit, its getting and cancellation, as well as the shortcomings and advantages of the procedure.

Auth.

7.C9.23. The quality traits of corn/maize (Baltis variety) and prevention of post-harvest washout of macronutrients. /J. Shavreshiani, N.Berenikashvili, T. Subeliani, T. Chitashvili/**.** Agrarian-Economic Science and Technologies. – 2010. – #2. – pp. 88-91. – geo.; abs.: geo.; eng.
The article deals with quality traits of corn as one of the most valuable food and feed crops, as well as with the measures aimed at lessening the use of mineral fertilizers and replacing them with organic ones. In this connection, the rates and terms of fertilizer application and their impact on different traits of the maize seed and straw are discussed, attention being paid to non-fertilizer methods of corn growing.

Auth.

7.C9.24. East Georgian black-earth soils' research materials and recommendations. /T. Khurtsidze, I. Gvimradze/**.** Agrarian-Economic Science and Technologies. – 2010. – #2. – pp. 93-96. – geo.; abs.: geo.; eng.
The article provides recommendations on the proper farming practices, the conduct of soil protection and productivity rise measures, the application of science-based and tested scientifically well-founded recommendations as the guarantee of obtaining highly productive and quality harvest. Also discussed are such issues as the measures aimed at reducing the rate of nitrates, maximum compliance with the sowing dates, protection of the soil from weeds, the application of proper irrigation techniques, a balanced application of mineral fertilizers and maximum use of organic/biological means, etc.

Auth.

7.C9.25. On the present state of the Georgian agrarian sector. /J. Archvadze, E. Mekvabishvili/. Economics and Business. – 2010. - #6. – pp. 107-114. – geo.; abs.: eng.
The article mentions agriculture as the oldest and traditional field of Georgian economy. At the same time, in addition to the role and importance of the sector, the authors mentioned the poor state in which the country's agriculture has been for quite a long period of time. The statistics of the employed in the agricultural sector

are given in comparison with other sectors of economy. The authors stress the necessity of taking energetic measures on the part of authorities to improve the situation and revive this traditional for Georgia sector.

Auth.

C10. Water Industry. Melioration

7.C10.1. Thermophysical calculation of a water-supply system of Madneuli Concentration Plant. /O. Lanchava/. Mining Journal. – 2009. – #1(22). – pp. 51-53. – geo.; abs.: eng., rus.

The main purpose of the calculation is to determine the thickness of the heat-insulating layer of water-supply pipes which is necessary for preventing the freezing of the system in the wintertime and the forming of a condensate in the summertime. Simple calculation formulas and methods are given to cope with the problem.

Auth.

7.C10.2. Hydrochemical indicators of Apsheron Archipelago water quality. /A. Abakarov, G. Mekhtiev/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 22-24. – rus., abs.: geo., eng., rus.

The article presents the hydrochemical indicators of the water quality within the tourism-development zone of the Apsheron Archipelago. The causes of water pollution in the area are discussed in detail.

Auth.

7.C10.3. Operational reliability of collector-drainage network. /A. Aivazov, R. Zakieva/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 25-30. – rus., abs.: geo., eng., rus.

The paper describes the results of an analysis regarding the efficiency of the collector-drainage network obtained on the basis of the actual data of the drain flow module in the period of land development. The mathematical-statistical data, the probability and reliability factors of the irrigation schemes are presented.

Auth.

7.C10.4. The impact of irrigation systems on ecological condition of Mil-Karabakh Pedmont Plain of the Republic of Azerbaijan. /A. Alimov, T. Zeinalov/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 31-34. – rus., abs.: geo., eng., rus.

The paper analyzes the changes of ecological and hydrogeological conditions that appeared after putting into operation large irrigation systems, increasing irrigated areas and water supply for irrigation, respectively. The alteration of groundwater regime of Piedmont Plain differs between top and end of the detrital cone of river arteries, which is associated with the flow rate of groundwater. This leads to the differentiation of ameliorative activities.

Auth.

7.C10.5. An improved design of water level meter for storage ponds. /I. Gabrichidze, Z. Gedenidze/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 45-47. – geo., abs.: geo., eng., rus.

The paper describes a new water level meter, which is characterized by its universality, high accuracy level and safety. The measuring device consists of float and counterweight (plummets) shafts. The measuring and transfer devices are connected to the axe-heads of toothed wheels located above the shafts. One end of the chain or rope thrown over the toothed wheels is connected to the float, and the other - to the counterweights. Variation of pond water level causes the flight and, appropriately, the counterweights to move up and down. The measuring device is recommended to be used in practice.

Auth.

7.C10.6. Impact of water flow rate on the canal structure dformationsadze, K. Bziava, I. Inashvili, N. Undilashvili/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 67-70. – geo., abs.: geo., eng., rus.

A semi-empirical limit dependence of channel-forming water flow velocity, which allows determining optimal parameters needed for the designing and construction of channels was determined.

Auth.

7.C10.7. Empirical dependences of rolling (bottom) and solid sediments in the catchment basins of Gorgian rivers. /R. Diakonidze, G. Chakhaia, L. Tsulukidze/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 77-81. – rus., abs.: geo., eng., rus.

The empirical dependences given herein can be used to provide approximate prediction for the unstudied rivers of Georgia regarding the discharge of bottom and solid sediments under natural conditions.

Auth.

7.C10.8. Possibilities to use binary tariffication of irrigation water. /M. Vartanov, K. Iordanisvhili/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 92-95. – rus., abs.: geo., eng., rus.
To increase efficiency in the use of irrigation water, a new differentiated tax should be assigned for water supply to the inner agricultural schemes. This tax should depend on natural-climatic and technical conditions of irrigation in accordance with general and preferential tariffs and penalties. The general tariffs include water supply for preliminary watering and irrigation season. The above-mentioned is calculated in accordance with the existing norms regarding the types of crops and individual farms, as well as other industrial needs. The preferential tariffs include water supply for water spreading and flushing. Penalties include excessive water supply during the irrigation season and for the other agricultural and industrial needs as well as unauthorized use of water.

Auth.

7.C10.9. Generalization of the time of hydrological drought and runoff characteristics in the rivers of the Lesser Caucasus. /F. Imanov, A. Guliyeva/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 125-129. – rus., abs.: geo., eng., rus.
The paper analyzes the time and characteristics of the hydrological drought in the rivers of Lesser Caucasus. The surveys have been implemented via the analysis of complex diagrams plotted for hydro economic year. The methods needed to analyze the characteristic of the hydrological drought are proposed on the basis of space-time fluctuations of runoff.

Auth.

7.C10.10. Eutrophication processes in ponds and reservoirs. /D. Kereselidze, V. Trapaidze, M. Alaverdashvili, G. Bregvadze/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 150-156. – geo., abs.: geo., eng., rus.
The resource degradation of ponds and reservoirs is caused by anthropogenic and natural eutrophication, which causes the loss of biogenic elements from the reservoirs. The initial biogenetic reproduction starts to exceed destructive processes; as a result, aerobic processes replace the anaerobic ones, the hygiene and drinking water quality, as well as sanitary and recreation conditions of pond deteriorate. The paper describes the factors causing the eutrophication of ponds and reservoirs and the assessment indices, as well as a mathematical model developed to forecast eutrophication processes in reservoirs, which depends on the population dynamics of phytoplankton in a reservoir. The theoretical model is based on the examples of some ponds and reservoirs. Some practical results are also given.

Auth.

7.C10.11. Theoretical and experemint methods to investigate and express infiltration. /R. Kiladze, L. Kekelishvili/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 178-183. – rus., abs.: geo., eng., rus.
The paper describes theoretical and experimental methods to express infiltration during the motion of variable water flow on leaking bottom. The authors have developed effective methods to express infiltration. The first – determination of identification parameters, especially, during the irrigation (initial stage), without implementation of special tests and, the second – use of test data concerning the infiltration without their processing.

Auth.

7.C10.12. Seepage resistance of subsurface drainage facility. /N. Makhmudov/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 189-191. – rus., abs.: geo., eng., rus.
The paper describes the results of surveys of the subsurface drainage made of PVC pipes placed on sandy gravel material. The authors have determined the seepage drainage resistances (total, general and additional) and compared them with rating values.

Auth.

7.C10.13. Indirect hydraulic jump of cohesive debris flow. /O. Natishvili, V. Tevzadze/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 192-196. – rus., abs.: geo., eng., rus.
The paper contains a design diagram for the indirect hydraulic jump of cohesive (high-concentration) debris flow during its influence on vertical wall, which is located at a certain angle to the motion of flow. It is recommended to consider the designed dependence of cohesive debris flow during its motion on the talus train. We have taken into account anomalous nature of cohesive debris flow.

Auth.

7.C10.14. New intake structures on mountain rivers. /R. Petevotyan/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 201-203. – rus., abs.: geo., eng., rus.
The article presents constructive solutions for the intake units on mountain rivers, which can provide maximum discharges during floods without damaging the structures. At the same time, they will provide efficient reception of required water, its preliminary treatment, removal of sediments from the structures and

their supply to the basin.

Auth.

7.C10.15. On the calculation of energy losses for the nonstationary laminar motion of viscous fluid in ring cylindrical pipe. /A. Sarukhanian/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 215-217. – rus., abs.: geo., eng., rus.
The article considers non-stationary laminar motion of viscous fluid in ring cylindrical pipe, as well as a mathematical module of the problem. The course of problem solution has been set out for general cases, when starting conditions and boundary conditions are provided in the form of random functions. The received general solutions allow resolving specific problems and determine the profile of velocities across the cross section of the flow, change in average velocity, and the quantity coefficient of motion, as well as loss of energy over time.

Auth.

7.C10.16. Prediction of erosion processes and debris flows in the basin of the Tskhenistskali Rver. /G. Chakhaia, R. Diakonidze, L. Tsulukidze, P. Lortkipanidze/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 228-231. – geo., abs.: geo., eng., rus.
Taking into account the quality of damages, the erosion coefficients of slopes were determined for the 14 tributaries (debris flow-type) in the catchment basin of the Tskhenistskali River. Also, there were determined quantitative values of erosion processes and maximum discharges of different debris-flow events. The predictable values, obtained on the basis of our surveys implemented in the catchment basin of the Tskhenistskali River, allow us to consider the existing ecological situation in the basin of the mentioned river and to use them against erosion and debris flow conditions.

Auth.

7.C10.17. Descriptive modelling of water pollution rate in water reservoirs. /Z. Tsikhelashvili/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 236-245. – geo., abs.: geo., eng., rus.
The descriptive models to assess and predict water pollution rate were developed to provide an integrated control of surface water pollution rate in water reservoirs (reservoirs, rivers, lakes etc.). They can be used as real instrumental tools to ensure the regulation of chemical contaminants, monitoring and control (supervision) and to avoid anthropogenic and man-caused pollution of surface waters in accordance with the categories of water use (potable and residential water use and fishery water use). The results of modeling are recommended for the adoption by the Ministry of Environmental Protection and Natural Resources of Georgia to provide integrated control of water pollution rate and by all those subjects, who are connected with the pollution of water reservoirs.

Auth.

7.C10.18. Assessment of effects of large reservoirs on peak discharges of transboundary rivers, South Caucasus. /N. Hasanova/.Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 250-256. – rus., abs.: geo., eng., rus.
The paper describes the results of assessment concerning the changes in natural maximum discharges of the Mingechaur and the Araks Reservoirs, and appropriately, of the Mtkvari and the Aragvi Rivers prior and after the construction of reservoirs. The author has used the statistical, graphical and comparative methods. It is established that the average annual maximum water discharge decreased by 59% in the section of Mingechaur, and by 48% - in the Kizil Vank section of the Araks River.

Auth.

C11. Foreign and Domestic Trade. Tourism

7.C11.1. Recreational peculiarities of Georgian health resorts. /I. Amkoladze, D. Megrelidze/**.** Gaenati Herald. – 2010. – v. 3, #3. – pp. 13-18. – geo.; abs.: geo.; eng., rus.
For centuries Georgia has been famous for its natural healing factors. There are a lot of ancient written sources evidencing miraculous healing properties of thermal waters. The major part of these resorts is located in the western seaside and mountainous regions. The positive, useful and healing properties of a mountain climate – clear air, sunshine intensity (ultraviolet, radiation) promote healthcare and recreation. The article distinguishes 340 health resort areas suitable for health treatment, prevention of diseases and recreation.

Auth.

7.C11.2. Georgia's foreign trade policy. /T. Kandashvili, L. Kochlamazashvili/. Caucasus International University Herald. – 2010. - #2. – pp. 217-221. – geo.; abs.: geo, eng., rus.
After Georgia gained her independence, the country embarked on a rather painful way of liberalization of trade relations, which has turned into a phenomenon leaving no alternative for elaboration of appropriate foreign trade policy and for integration into international trade system. It is vital for Georgia to be a member

of the World Trade Organization (WTO), which advocates Georgian economics to be integrated in the world economic space. The international trade policy is extremely important for Georgia during the transition to the new economic system. After a long-term isolation, the newly independent country efficiently tries to take her place in the world commonwealth and implement the perfect integration of the state economy into global economic system.

Auth.

7.C11.3. Service quality evaluation methods in tourism marketing. /Ch. Jashi/. Economics and Business. – 2010. - #6. – pp. 115-128. – geo.; abs.: eng.
The article aims at analyzing the available service quality ebaluation methods in the sphere of tourism, based on the works by well-known foreign researchers. A popular service quality evaluation model is the so-called SERVQUAL developed by Parasuraman, Zeithaml, and Berry in 1982. The following five key dimensions were qualified to measure the service quality in tourism: reliability, assurance, tangibles, empathy, and responsiveness. The model is qualified a useful instrument to identify the gaps between customers' expectations and customers' perceptions of the services. The model contains 22 items for assessing customer perceptions and expectations regarding the quality of service. A level of agreement or disagreement with a given item is rated on a seven point Likert-type scale. The SERVQUAL model has been extensively used in service sectors of many countries. Consumer satisfaction is a holistic dimension and result of service quality in tourism. Quality and consumers satisfaction measurement will give the possibility to identify the demands of different segments of potential consumers. It is very important to integrate the methods of measurement of service quality in practice for developing tourism marketing in Georgia. It should be provided consumer oriented researches of tourism market not only in terms of scientific , but for wide promoting Georgian tourist product in the domestic and global markets.

Auth.

C12. Transport

7.C12.1. Express-diagnostics and control for determining worthiness of car brake systems. /T. Dvalishvili, R. Chabukiani, B. Bobokhidze/. Science and Technologies. – 2009. - #10-12. – pp. 73-75. – geo., abs.: eng., rus.
The work deals with a new express monitoring method and a respective diagnostic device designed for determining the efficient performance of an automotive brake system which ensures in a short period of time, 20-25 seconds, to determine serviceability of the brake system. The method and the device make it possible to establish and exercise regular monitoring of the brake system and exclude the putting in operation of an automobile with a faulty brake.

Auth.

7.C12.2. Improving the passability of high-tonnage, all-wheel drive trucks by using a hydro-pneumatic shock-absorber in their suspension. /T. Morchadze, D. Kbilashvili, G. Gogitidze/. Science and Technologies. – 2009. - #10-12. – pp. 76-80. – geo., abs.: eng., rus.
To improve the passability of high-tonnage, all-wheel drive trucks, an original design of hydro-pneumatic shock absorber is proposed. It is a combination of hydraulic and pneumatic devices for the vertical damping of vibrations. A detailed description of the design and its technical features is given.

Auth.

7.C12.3. Servicing characteristics of a motor vehicle's power supply system. /I. Kamkamidze, T. Kochadze, N. Kanteladze/. Science and Technologies. – 2009. - #10-12. – pp. 81-86. – geo., abs.: eng., rus.
The work considers the servicing modes of a motor vehicle's power supply system; their negative sides, and a new formulation of the power balance, providing for the temperature indicators of the storage battery, as well as many other relevant indicators and chrematistics.

Auth.

7.C12.4. Calculation of dead-liquid cooling dynamics in pipelines. /V. Silagadze, M. Jangidze/. Science and Technologies. – 2009. - #10-12. – pp. 93-96. – geo., abs.: eng., rus.
The calculation dependences of dead-liquid cooling dynamics in pipelines are analyzed in the article. A difference between the cooling calculation time and experimental data is fixed. The conversion coefficient to be included in the calculation formula is set.

Auth.

7.C12.5. Theoretical investigation of secondary suspension bracket. /G. Lekveishvili, I. Kachakhidze, K. Chanturia, P. Gogiashvili/. **S**cience and Technologies. – 2009. - #10-12. – pp. 87-92. – geo., abs.: eng., rus.
During composition of a mathematical model, it is necessary to meet the main requirement - the model shall ensure determining of all the searching values with the sufficient accuracy for engineering calculations. There is necessary to envisage the main distributive function, in particular an action came from the road and those dynamic parameters, which mostly are acting on the research process. In compliance with the task

assigned for the theoretical investigation of the cabin's secondary suspension bracket it is necessary to envisage the elastic damping characteristics of the tire, main suspension bracket, cabin's secondary suspension bracket and of driver seat. It is necessary to envisage the non-linearity in the developed mathematical model with consideration to preserve the dynamic model's internal properties. In consequence of the above mentioned, in order to provide the research works it is necessary to create the plate model for the system ~road-eye-suspension bracket-cabin- seat suspension bracket", in compliance with which we will study the intensity of the fluctuations came to the seat. Then we are determining the impact of the longitudinal-vertical fluctuations on the driver's cabin and seat, selecting the rational values of the elastic-damping characteristics. In compliance with above mentioned there is created the plate mathematical model, defined the road's distributive function. In accordance with mathematical model there is made up the nine-degree freedom equation system with two variables, determined the appropriate factors and values, the calculation of which is possible by means of statistical-dynamic method.

Auth.

7.C12.6. On the essence of transition creep and roughness curves of carriage wheel roll surface. /G. Sharashenidze, N. Mgebrishvili, P. Kurtanidze, T. Dundua, S. Sharashenidze, G. Usanetashvili/. Science and Technologies. – 2010. - #4-6. – pp. 90-97. – geo., abs.: eng., rus.
The article gives a kinematic analysis of the carriage wheel movement taking into account of short roughness on the wheel roll surface. The functional dependencies of roughness are given. The necessity of reduction of geometrical roughness for the purpose of improvement of the carriage dynamics and the rolling stock traffic safety is established.

Auth.

7.C12.7. Modern trends of cargo and passenger transportation development on the Georgian Railway. /P. Kenkadze, L. Lomsadze, G. Zhvania, P. Kutateladze, D. Kiknadze/. Science and Technologies. – 2010. - #4-6. – pp. 111-114. – geo., abs.: eng., rus.
The article considers the current development of transportation process (cargo and passenger transportations) on the Georgian Railway. Further directions of the transportation process development in are defined, taking into account the existing and prospective technological factors as well as the requirements of modern international transport passageways.

Auth.

7.C12.8. Influence of non-technological clearance on kinematic parameters of the motor car lever transmission. /G. Sharashenidze, T. Dundua, A. Sharvashidze, P. Kurtanidze, M. Akhalbedashvili, I. Jvarsheishvili/. Science and Technologies. – 2010. - #7-9. – pp. 77-84. – geo., abs.: eng., rus.
The work considers the questions of theoretical research of kinematic parameters of the electric train motor car lever transmission, taking into account non-technological clearances in joint connections. The formulas with generalized co-ordinates, defining displacements, linear speeds and accelerations of the levers' center of mass and contact points of joint connections with clearances, and rotation angles of brake transmission leverage are given.

Auth.

7.C12.9. On the sectioning of the main hydratransport system for averting pressure jumps. /L. Makharadze, A. Sharikadze, S. Steriakova/. Mining Journal. – 2009. – #1(22). – pp. 38-42. –rus.; abs.: eng., geo.
An issue of sectioning the main hydrotransport system for the purpose of averting the onset of pressure oscillations is examined. It is stated tat in many instances this method can be successfully realized for the purpose of averting pressure jumps during the startup and stoppage of the system, provided the specific conditions (the length of pipeline main and its longitudinal section) of functioning are rationally . The methods of rational sectioning and recommendations for selecting a respective implementation mechanism are given.

Auth.

7.C12.10. Calculation of the ropeway haulage rope's longitudinal oscillation parameters. /T. Javakhishvili/. Mining Journal. – 2009. – #1(22). – pp. 43-47. – geo.; abs.: eng., rus.
The ropeway haul rope's longitudinal oscillation parameters are calculated based on the fact that the rope is an equivalent spring with a weight suspended thereon. The main allowance consists in the fact that the vibration at the point of weight suspension rather than of the whole rope is discussed. The rope rigidity and bringing mass coefficient calculating formulas are given; oscillation frequency calculating formula is deduced. The rope oscillation parameters' dependence on span length, rope load and its location in the span, span chord slope angle, etc. are analyzed. The sphere of application of results is reversible aerial ropeways and crane cables.

Auth.

7.C12.11. Fire safety analysis of ventilation systems of road tunnels. /O. Lanchava/. Mining Journal. – 2010. – #1(24). – pp. 100-104. – geo.; abs.: rus., eng.

A method of mathematical modeling is used to analyze the impact of strong and very strong fire on ventilation systems of road tunnels for the purpose of establishing the period of their collapse and management of extreme situations. Models are executed for a longitudinal ventilation system using jet fans and for semi-cross-section sucking away system of airing which are adapted in Georgia. The fire temperature of the models varied within the limits of 300-1000 ^{0}C, its thermal capacity being 30-100 MW. At the temperature 1000 ^{0}C, the period of collapse for the semi-transverse exhaust ventilation system varied within 0.5-2.5 minutes, depending on the thermal capacity of fire. About the same period is characteristic of the longitudinal system. In terms of control in emergencies at strong and very strong fires, none of the considered systems is efficient. In this case, the only way to save the lives and the infrastructure is an operative partition of the tunnel into short sections by moving crosspieces or like means to suspend or completely stop the uncontrolled penetration and distribution of toxic gases and superfluous heat in the underground space.

Auth.

7.C12.12. Prospects of cable transport use in Georgia. /L. Makharadze, K.Khatiashvili/**.** Mining Journal. – 2010. – #2(25). – pp. 39-43. – geo.; abs.: geo.; eng., rus.
A short history of new generation cable transport origin and development, its main constructive elements, positive and negative sides, spheres and scale of application is given; on the basis of which recommendations about prospects and area of its use in Georgia are made.

Auth.

7.C12.13. The aerodynamic calculation of Marabda-Akhalkalaki line railroad tunnels. /O. Lanchava/**.** Mining Journal. – 2010. – #2(25). – pp. 55-58. – geo.; abs.: geo.; eng., rus.
The airflow in a tunnel under the influence of the swabbing effect of train movement and aftereffect is established by means of an aerodynamic calculation. It is found that for the given tunnel conditions about 2/3 of the airflow resulting from the swabbing effect move in the direction of the train movement, while the rest flows in the opposite direction, to a free space between the train and the tunnel line. This provokes air turbulence and represents a common constituent of aerodynamic resistance. Despite this, all galleries of the Marabda-Akhalkalaki trunk-railway can be aerated at the expense of natural draught resulting from the train swabbing effect. To better use the swabbing effect-generated draught, all chambers and niches should be equipped with air holes along the both sides of the tunnel. The sectional area of each air hole should make 5.6m^2. The mentioned measures will lessen the aerodynamic resistance aroused by the airflow and allow supply of the calculated air to the tunnel using the swabbing effect.

Auth.

7.C12.14 The thermophysical calculation of ventilation of Marabda-Akhalkalaki railroad tunnels. Mining Journal. – 2010. – #2(25). – pp. 59-64. – geo.; abs.: geo.; eng., rus.
The article deals with the thermophysical calculation of the ventilation of tunnels and the preparation of a working draft of ventilation by order of the State Transport Engineering Institute (Kiev) – winner in a tender announced by Georgian Railway. The calculation results for the longest in Georgia tunnel are given. These results cam be used for shorter tunnels as well. The calculation details are given.

Auth.

C13. Medicine. Healthcare

7.C13.1. Textile bandage materials in the treatment of diabetic foot. /E. Buadze, N. Abuladze, L. Chkeidze/. Georgian Scientific News. – 2010. - #1(5). – pp. 22-30. – rus., abs.: geo., eng., rus.
The materials for using the textile bandages in treatment of diabetic foot are searched. It is found that among the applied treatment methods textile bondage materials prevail and that none of the bandage materials available on the pharmaceutics market meet the standards that are essential in the treatment of diabetic foot.

Auth.

7.C13.2. Study of the effect of medicinal napkins on living organismus. /E. Buadze, N. Pailodze, R. Sakandelidze, O. Metreveli/. Georgian Scientific News. – 2010. - #1(5). – pp. 31-34. – rus., abs.: geo., eng., rus.
The article provides the results of study of toxic and antimicrobial effects of special medicinal napkins toxicological on living organisms. In studying the effect of such napkins on healing wounds in Wistar white rats, it was found that (i) the medicinal napkin is nontoxic and does not affect the rat's organs and weight; (ii) no signs of allergy are observed in the places of application; (iii) the best results in terms of wound healing and antimicrobial status are obtained in the case of the napkin prepared under the recipe #3; (iv) the established medical composition is as follows: metiluracil – 18%, levomictin – 24%, actovegil –0,6%, filling agent -57,4%.

Auth.

7.C13.3. The green world around us. /Z. Vadachkoria, E. Buadze, S. Zhorzholiani/. Georgian Scientific News. – 2010. - #1(5). – pp. 56-59. – rus., abs.: geo., eng., rus.
The article deals with the questions of phototherapy. It shows its role in the treatment of various diseases. The sources and questions of treatment by plants of different countries and peoples since the prehistoric times up to these days are surveyed. Based on the work performed, it is concluded that phototherapy has great and brilliant prospects.

Auth.

7.C13.4. Bioethical questions of interrelation with patients. /G. Eliava, I. Khintibidze, D. Gabunia, K. Gugeshashvili, M. Jashi/**.** Gaenati Herald. – 2010. – vol. 3, #3. – pp. 47-54. – geo.; abs.: geo.; eng., rus.
In the doctor-patient relations attention should be paid to the patient's age; close relationship with the patient's relatives; in addition to conservative and surgical ways of treatment, of special importance for the treatment process and outcome is the therapeutic property of 'the doctor's word'.

Auth.

7.C13.5. Etiopathogenesis and pathanatomy of acute periodontitis. /G. Eliava, I. Chikobava, M. Rekhviashvili/**.** Gaenati Herald. – 2010. – vol. 3, #3. – pp. 55-60. – geo.; abs.: geo.; eng., rus.
The work discusses various forms of periondotitis, including the medicament one which can be caused by the action of biogenic amines on the periodontium Specific and general non-specific reactions are considered. The pathologoanatomic picture changes at the early and late stages of acute periondotitis. Micro abscesses and dystrophic changes in the bone tissue are characteristic of the late stage.

Auth.

7.C13.6. Principes of contruction of salivary glands and evolutionary changes ol secretion. /G. Eliava, I. Chikobava/**.** Gaenati Herald. – 2010. – vol. 3, #3. – pp. 61-66. – geo.; abs.: geo.; eng., rus.
The principles of evolution are revealed in salivary glands, their essence being the creation of a material substrate for implementation of a reinforced function and duplication the action of other organs

Auth.

7.C13.7. Structural and functional changes of lungs in an antenatal and postnatal ontogenesis. /D. Kobeshavidze, N. Sharashenidze, G. Eliava/**.** Gaenati Herald. – 2010. – vol. 3, #3. – pp. 67-72. – geo.; abs.: geo.; eng., rus.
In addition to their function in respiration, lungs can perform other functions as well, such as the taking a part in heat regulation, apportioning function, defensive function. The maximum quantity of bronchial rows is achieved in a sixteen-week embryonic development of lungs. Intensive 'alveolization' is characteristic of newborns until reaching by them of the five-year age. In a postnatal ontogenesis, the development of lungs is characterized by the growth of both acinuses and their individual parts, as well as by the continuous transformation of all their structures.

Auth.

7.C13.8. Effects of phosphate slag on skeleton formation. /R. Mzhavanadze, N. Menagarishvili, R. Datunashvili, M. Chedia, M. Grigolashvili, N. Goderdzishvili/**.** Gaenati Herald. – 2010. – vol. 3, #3. – pp. 73-76. – geo.; abs.: geo.; eng., rus.
Since the phosphate slag consists of calcium by 47%, it was of special interest to study its effects on the skeleton formation processes. In an experiment to study distant results, pregnant white rats were fed with phosphate water at the rates 10, 20, and 50 mg/kg. Following sacrifice, the embryo's skeleton development study revealed the phosphate slag within 10, 20, and 50 mg/kg high and inactive doses did not affect the skeleton development process as compared with the control group.

Auth.

7.C13.9. Age dynamics of a partial pressure of oxygen and its peculiarities in a intrauterine period. /D. Kobeshavidze, N. Sharashenidze, L. Berulava, D. Gabunia, G. Eliava/**.** Gaenati Herald. – 2010. – vol. 3, #3. – pp. 77-84. – geo.; abs.: geo.; eng., rus.
The fetus tissue cells are evolutionally accustomed to existence under conditions of low partial pressure of oxygen. A change in the thickness of placenta membrane may become a risk factor for the fetus viability. A high compatibility of the fetus hemoglobin with oxygen promotes effective supply of the mother-fetus system oxygen. The compensational-adaptive reactions of the mother-fetus system provide adequate intensity of oxygen in the blood of the mother and the fetus.

Auth.

7.C13.10. The prospects of using balloon coronary angioplasty and aortocoronary bypass in different manifestations of heart ishemic disease. Gugeshashvili, G. Eliava/**.** Gaenati Herald. – 2010. – vol. 3, #3. – pp. 85-90. – geo.; abs.: geo.; eng., rus.
The conduct of coronary angiography is recommended for patients ill with a severe angina pectoris (III-IV functional class) in addition of drug therapy, so that balloon coronary angioplasty and aortocoronary bypass

are carried out according to degree and character of damage of the coronary arteries. The utilization of early revasculization technologies improves both the short-term and long-term prognosis.

Auth.

7.C13.11. Pecularities of the cardiovascular system status change during various sizes of the arterial (Botallo's) duct. /D. Gugeshashvili, G. Eliava/**.** Gaenati Herald. – 2010. – vol. 3, #3. – pp. 91-96. – geo.; abs.: geo.; eng., rus.
Congenital malformations are anomalies of the embryonic heart development. One of the congenital transformations is the open arterial duct (*patent ductus arteriosus*), which functions in fetal life. Decompensation effects are not revealed in the case of a small-size arterial duct. In the case of a big-size duct, the prognosis is unreliable, this being related to the development of a septic process in the duct and further transfer to valves, as well as to development of decompensation.

Auth.

7.C13.12. Public healthcare trends in Georgia. /T. Inasaridze/. Caucasus International University Herald. – 2010. - #2. – pp. 207-212. – geo.; abs.: geo, eng., rus.
The reforms aimed at transformation of the financial and institutional settings of the healthcare and social sectors have lasted over ten years in Georgia. However, the reforms are still on the agenda. The absence of the market stimulation and the competition became the core for the healthcare reform, which, based on the principles of a market economy, foresees the regulations. The main trend of the public healthcare is to be focused on the issues of the health and respective human rights protection of the socially vulnerable (disadvantaged) people. In this regard, for protection the interests of this group, it is possible to involve the civil society in the planning of the public health care policy and in assessment/monitoring of quality of the public health care service provision. This involvement of the civil society would contribute to the transparency of the State's activities and would increase its accountability to the society.

Auth.

D. INTERSECTORAL PROBLEMS

D1. Organization and Management

7.D1.1. Selection of rational capacity and structure of bus fleet. /G. Metekheli/. Science and Technologies. – 2010. - #4-6. – pp. 98-101. – geo., abs.: eng., rus.
The work considers combined and cooperative schemes of bus-operational enterprises and proposes selection criteria of effective options of bus enterprises.

Auth.

7.D1.2. Ways of increasing the technical capacity of main railway yards. /T. Kotrikadze, A. Sharvashidze, K. Sharvashidze/. Science and Technologies. – 2010. - #4-6. – pp. 102-105. – geo., abs.: eng., rus.
The article considers the ways of increasing the technical capacity of main railway switchyards by proposing two interrelated subsystems (complexes), as breaking-up and making-up complexes. Also presented are possible schematic options of the development of switchyard breaking-up and making-up technological complexes with wide application of trains parallel marshaling, the introduction of which would increase the switchyard capacity approximately by 15-20%. It is a great reserve of increasing the carrying capacity of a railway.

Auth.

7.D1.3. Intensification of operation of industrial reailway yards. /G. Telia, K. Sharvashidze, I. Modebadze/. Science and Technologies. – 2010. - #4-6. – pp. 106-110. – geo., abs.: eng., rus.
The article analyzes essential schemes and operation technology of industrial railway yards, identified problems of operation and a rational scheme of operation of industrial yards under modern conditions. In addition, refined methods of calculating the useful length of tracks of the given yard are given.

Auth.

7.D1.4. The dominant leadership style in Georgia. /N. Tkeshelashvili/. Georgian Scientific News. – 2010. - #1(5). – pp. 17-22. – eng., abs.: geo., eng., rus.
Leadership is a topic with universal appeal, and in the popular press and academic research literature much has been written about leadership. It is a highly valued phenomenon that is very complex. For centuries leadership theories have focused on leadership as a trait. This view restricts leadership to only those who are believed to have special characteristics. In contrast, the style approach in this research suggests that leadership is behavior that can be learned, changed, and improved. Using Blake and Mouton's Managerial (Leadership) Grid®, quantitative data based on The Ohio State University Leadership Behavior Description Questionnaire (LBDQ), and semi-structured interviews' results, we have attempted to describe the dominant

leadership style in Georgia for further changes and development. Based on subordinates' implicit belief-set dominating leadership style in Georgia tends to be Middle-of-the-Road Leadership, which tries to keep a balance between concerns for Production and Employees, that includes in itself a necessity of giving away a bit of each behavioral value.

Auth.

7.D1.5. Financial-credit mechanism and financial management. /G. Tsaava, M. Zedginidze/. Science and Life. - 2010 - №1. - pp. 26-32. - geo.; abs.: geo., rus., eng.
The article deals with the financial-credit mechanism as a system of management. This system is not only the simple mechanical sum or conglomerate of management methods, levers and incentives, but it is a new aggregate which has completely new qualitative features. The economic essence of management's classical functions (planning, organization, stimulations, control) is coincided with the financial-credit mechanism in economy with systematic usage in consideration with the modern demands of the development on the micro and macro level.

Auth.

7.D1.6. Optimal control of orders in agricultural production. /I. Khasaia, R. Kopaliani, M. Chumburidze/**.** Agrarian-Economic Science and Technologies. – 2010. – #2. – pp. 100-102. – geo.; abs.: geo.; eng.
In the given work, an optimal control system of multistage distribution of industrial reserves and placment is constructed by using a solver program. Before realizing dynamic programming tasks, including tasks of production resources optimal distribution as a mathematical model in the solver program, a description of initial conditions of the problem in Excel should be done. By means of Boolean operators, a simplified procedure of the description of statements of the problem is built. A sequence of effective and dynamic data management structures is obtained. In the case of information arrays, the latter ensures optimal control of RAM and improves the program interface. The introduction of such a technique by using information technologies will promote the formation of a correct agrarian policy under conditions of market relations

Auth.

7.D1.7. Proposals for restoring land resources as a tangible wealth. /J. Zibzibadze, L. Gegenava, L. Shoshiashvili/**.** Agrarian-Economic Science and Technologies. – 2010. – #2. – pp. 104-108. – geo.; abs.: geo.; eng.
The article deals with the growing dependence of Georgia on imports of staple farm products, the causes of the above and the reserves available in the country to substitute imports with locally made agricultural products. Based on the appropriate data, it is concluded that a new national agrarian policy needs to be developed and implemented in the following main directions: perfection of the economic mechanism operating in the agrarian sector, implying the activation of agriculture-targeted credit, tax and insurance systems; the fixing and protection of a parity of prices on farm products and farm equipment; the raising of the agrarian sector competitiveness through a reasonable coordination of the government regulation and market self-regulation mechanism and the development of industrial and social sphere in rural areas; the proper selection of export-oriented branches and the working out of purposeful state programs of their development, and the formation of a system of extension services and its real activation, etc.

Auth.

D2. Environmental Protection. Ecology

7.D2.1. Ways of preventing the emission of substances causing ozone layer depletion. /L. Kvinikadze, S. Suladze/. GEN. – 2010. - #1. - pp. 95-99. - eng.; abs.: rus.
One of important measures aimed at the development of programs for reduction of consumption of ozone-depleting substances is the collection of data on the refrigerants used in the country and the development of the technique of their quality evaluation. The work on collecting ozone-depleting chlorofluorocarbons (CFCs) and hydro chlorofluorocarbons (HCFCs) from refrigeration and air-conditioning systems in various regions of Georgia was performed. The standard composition of a refrigerant was restored, which would prolong the operation time of the refrigeration equipment. This approach is economically sound at the transition stage of usage of expensive modern refrigerating systems.

Auth.

7.D2.2. Problem of thawing of glaciers in mountain regions. /M. Jibladze, A. Mikaberidze, Z. Razmadze, P. Magalashvil/. Science and Technologies. – 2009. - #10-12. – pp. 13-15. – geo., abs.: eng., rus.
It is shown that some increasing of middle year temperature of terrestrial surface leads to considerable increasing of temperature in mountain regions and hence, to increasing of glacier thawing intensity. This phenomenon is explained by existence of a positive feedback between local albedo of a mountain region and the mean annual temperature of this region. The process also speeds up thawing of glacier of Antarctic, Arctic region and Greenland.

Auth.

7.D2.3. Transport and ecology. /A. Nozadze, T. Natriashvili/. Science and Technologies. – 2010. - #7-9. – pp. 67-76. – geo., abs.: eng., rus.
Principle causes of the environmental impact of emissions of internal combustion engines and stationary installations are analyzed and discussed. The achievements of nano-technologies – membrane separators of air for increasing the concentration of oxygen in air-absorption systems for the purpose of ensuring full combustion of fuel and decreasing toxicity of emissions are given.

Auth.

7.D2.4. Save nature – save your life. /I. Bejanidze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2010. – vol. 36. – #1. – pp. 76-83. – eng.; abs.: geo., eng.
Galvanic and metallurgical industries annually release into the sea great quantities of valuable and scarce substances which could be recovered from this sewage for their industrial recycling. Heavy metal salts, acids, alkalis, oils, detergents from galvanic/ metallurgical industry and ammonium chloride from cellulose industry aggravate the ecological situation becoming a menace to human health and marine life. By the application of reagent-free, eco-pure electrodialysis method to the salt solutions (NaCl, Na_2SO_4) artesian and sea water the feasibility of the composite technology development for the manufacture of a number of products and the sea water rectification from galvanic/ cellulose industry sewage is shown. Technological modes for these procedures on 12 electrodialysis schemes with the use of ion-exchange and bipolar membranes have been researched and developed. The most effective seven schemes have been chosen. These schemes allow to simultaneously achieving several objectives within a single production cycle.

Auth.

7.D2.5. Basic contaminants of the air and their toxic effects on humans. /E. Lekveishvili, N. Khetsuriani, E. Topuria/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 381-383. – rus.; abs.: geo., eng.
Basic contaminants of the air – carbon oxides, sulfur and nitrogen, hydrocarbons, hydrogen sulfide, carbon disulfide, smoke, soot, etc. - have been considered. Transports, TPPs, heating systems, industrial enterprises represent the main air contamination sources. The paper discusses interrelation between the air contaminants and a number of various diseases caused by them. Ways of the environmental protection as well as the biosphere stability conservation are presented.

Auth.

7.D2.6. Global warming and problems of heat-and-power engineering. /N. Aslanikashvili, A. Suladze/. Mining Journal. – 2009. – #2(23). – pp. 72-76. – geo.; abs.: rus., eng.
It is supposed that the orbital and endogenous (deep) processes are responsible for climatic changes on the Earth (global warming, depletion of the ozone layer, etc). This assumption is evidenced by the facts that some mineral deposits (coals, clay, stone salt, bauxites and so forth) are directly connected to paleo and to present climatic zones of the Earth. Based on statistical data, dependence schedules between the quantity and intensity of volcanic eruptions for the period 1840-2000 have been constructed. A comparison of these schedules with the paleoclimatic data makes obvious that there is a functional (linear) dependence between a rise in global temperature and the intensity of volcanic eruptions. Thus, the widespread, but insufficiently proved, position about the made-made causes of global warming and conformity of measures taken in this direction is not effective.

Auth.

7.D2.7. Features of fluoride-containing natural drinking waters and prospects of their use in Georgia. /B. Zautashvili, N. Zautashvili, B. Mkheidze, I. Nanadze, I. Raevskaia/. Mining Journal. – 2009. – #2(23). – pp. 76-78. – geo.; abs.: rus., eng.
The importance of the both an excessive and insignificant content in drinking waters of a biologically active element – fluoride – is considered. To cope with the problem of teeth diseases (caries), the use of fresh nitrogenous thermal waters of the Ajara-Trialeti folded system is recommended. These waters are noted for good drinking properties, admissible content of fluoride (0.5-1.2 mg/l) and plentiful yield.

Auth.

7.D2.8. Global warming and the associated process of desertification in southeast Georgia. /L. Kharatishvili, T. Gabetsadze, Z. Kakulia, B. Ukleba/. Mining Journal. – 2009. – #2(23). – pp. 79-80. – geo.; abs.: rus., eng.
This work is dedicated to the questions of the influence of global warming on separate ecosystems of southeast Georgia, specifically on the Iori River plateau. The sensitivity of the investigated region to climate changes and the associated desertification of the plateau are given. A series of actions to prevent and stop these adverse processes and improve the environments is proposed.

Auth.

7.D2.9. The present state of biocoenosis in Kolkheti shelf zone. /T. Akhvlediani/. Collected Papers of the

Institute of Water Management. – 2009. - #64. – pp. 35-38. – rus., abs.: geo., eng., rus.
The paper describes an analysis of the development of biocoenosis in Kolkheti Shelf Zone. To decrease the quantity of nitrogen and phosphorus in the shelf, the inventor suggests using a biological method, which provides the creation of the plantation of Laminaria plants and the periodical removal of biomass from the coastal ecosystem.

Auth.

7.D2.10. Environment-friendly logging technologies and machinery under mountain conditions. /Z. Balamtsarashvili, D. Mosulishvili/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 39-44. – geo., abs.: geo., eng., rus.
The paper contains an analysis of fundamentals regarding logging and felling operations. Special attention is paid to the development of technological schemes needed for complex mechanization of environment-friendly logging operations and the investigation of logging machinery needed for the implementation of the above-mentioned operations: logways, loggers, single and double rope pullies, log-transfer devices, wheeled tractors etc. Also, the paper includes the results of theoretical surveys implemented by the authors regarding the passability and safety of log-transfer device (MTA) developed on the basis of tractor TT4 during the lateral and longitudinal motions.

Auth.

7.D2.11. Assessment of economical and ecological damage to forests burned as a result of the 2008 August war in Georgia and preventive measures against soil erosion on mountain slopes. /G. Gavardashvili, M. Vartanov/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 48-59. – geo., abs.: geo., eng., rus.
On the basis of methods developed in the Institute of Water Management, the damage to forest (1003 ha) burnt by fire in Borjomi and Ateni ravines and near Gori during the war is found to equal to GEL 1,212, 595 billion, or Euro 550 million. On the basis of field surveys, it was determined that about 191 ha (84%) of 250 ha forest burnt in Borjomi District can be considered as sections sensitive to erosion processes. To predict the erosion processes for the above-mentioned areas, the authors used the methods of Acad. Ts. Mirtskhulava and the scale of English Professor R. Morgan, according to which the conditions of slopes within the catchment basins of Nagvarevi, Mtsa, and the so-called Rusi can be considered as the 2^{nd} degree erosion with 2-5 t/ha transportation of soil particles annually. To prevent erosion processes on the burnt slopes, the authors considered a lot of different resource-saving light structures (to construct levees and terraces), their scientific priorities are protected by Georgian and foreign patents.

Auth.

7.D2.12. Results of landslide-gravitational conditions and principles of their development in Georgia. /G. Gobechia, E. Tsereteli, I. Bondirev, G. Gaprindashvili, Ts. Donadze/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 60-66. – geo., abs.: geo., eng., rus.
The paper describes and assesses the principles of landslide-gravitational conditions, including their typological specification. Also, we have determined dangerous risk, and paid special attention to techno-gravitational phenomenon. On the basis of quantitative measures of a geological threat, landslide-gravitational processes and the risk of their possible activation in accordance with their distribution and occurrence, we have subdivided the territory of Georgian into 7 conventional regions (zones). In accordance with the zoned areas, geo-monitoring of a regional significance should be organized for the areas located within the most dangerous zones, especially, for the settlements and strategic objects (highways, oil and gas pipelines, high-voltage transmission towers and electric power grids, hydraulic and irrigation objects, in land-scape-geographic area). The assessment and prediction of geological processes should be implemented both prior the land development and during the construction. Their liquidation or mitigation measures should be taken into account at the project level. Mode-instrumental observations of the second and the third levels should be implemented for the separate representative objects.

Auth.

7.D2.13. Assessment of ecochemical situation of the Mtkvari River tributaries within Tbilisi area. /R. Diakonidze, I. Pirtskhalaishvili, N. Vepkhviashvili, Ts. Martiashvili, M. Chankashvili/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 71-76. – geo., abs.: geo., eng., rus.
The paper describes the problem of natural and anthropogenic factors affecting water resources within Tbilisi area. To assess the contamination of water resources with heavy metals, we have carried out field surveys of twenty tributaries of the Mtkvari River. Also, we have used other materials, which describe the above-mentioned problem. The survey reveals that the tributaries of the Mtkvari River are strongly contaminated with heavy metals in accordance with the norms concerning the permissible concentrates of waste waters. To assess the quality of contamination in the tributaries of the Mtkvari River, we plan to continue our field surveys.

Auth.

7.D2.14. Geoenvironmental surveys of burnt areas near Tsagveri and Daba villages, Borjomi district.

/T. Tevzadze, V. Shurgaia, M. Shavlakadze, D. Potskhveria/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 114-124. – geo., abs.: geo., eng., rus.
This paper includes the results of geoecological surveys of burnt areas located near Tsagveri and Daba villages of Borjomi District. On the basis of an analysis, the authors state that the natural environment underwent irreversible influence (unique forest burned in health-resort zone, a layer of soil is destroyed, slopes are under the influence of erosion processes, the surface flow contains increased amount of sodium ions by 8,6-14.4). Conclusions and recommendations are proposed to avoid the further development of negative processes.

Auth.

7.D2.15. Adoption and development of clean technologies and production of ecologically safe products as a base for the stable development of Ukraine. /S. Kuzin, E. Utkina/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 184-188. – rus., abs.: geo., eng., rus.
The article examines current trends in the implementation of cleaner production technologies and organic food production in Ukraine and gives recommendations regarding the more efficient usage of current production capacities. The existing legislative base and its potential adaptation to changing conditions are examined.

Auth.

7.D2.16. Information formalization of planning the optimal route of navigational control during the ecological monitoring. /B. Rustambekov/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 204-208. – rus., abs.: geo., eng., rus.
The article describes a simulation model of spectrophotometric experiment. Using this model, the authors have implemented optimal planning and calibration of multi-level spectral measurements concerning the radiation field for the different optically inhomogeneous sections of the earth's surface.

Auth.

7.D2.17. Soil damages caused by floods and ways to avoid them. /L. Purtseladze/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 218-223. – geo., abs.: geo., eng., rus.
This paper describes soil resources; soil erosion is considered as a varied process being invoked by the action of water, rivers and rocks and causing destruction of the topsoil. Some types of erosion caused by different natural and man-made factors and the ways to avoid them are given.

Auth.

D3. Statistics

7.D3.1. Georgia's total external debt against the background of the increases mobilization of internal resources. /G. Khantadze/. Science and Life. - 2010 - №2. - pp. 44-49. - geo.; abs.: geo., rus., eng.
The article deals with the seriousness of the problem of Georgia's total external debt and attempts to consider the ways to cope with the problem. As the official data demonstrate, the total external debt of Georgia by 30 June 2010 amounted to USD 8720 million. Moreover, in order to ascertain the magnitude of the external debt and the capacity of its service, the authors use the internationally recognized standard rates: 1) the ratio of the external debt per capita, which makes USD 1,969. Considering the vulnerable economy of our country, this seems inconceivable; 2. The ratio of the total external debt from export reached by 31st December 2009 amounted to 455%; 3. The ratio of the total external debt from GDP by 31st December 2009 amounted to 80% (the critical verge is 50%).

Auth.

D4. Other Intersectoral Problems

7.D4.1. The theoretical possibility of the textile dental cords formation by the untwisted yarns. /T. Moseshvili, I. Kldiashvili/. Science and Technologies. – 2009. - #10-12. – pp. 119-122. – geo., abs.: eng., rus.
The textile materials, such as flosses and retraction cords, are used in stomatology for cleaning the tooth and treatment of parodontosis and gingivitis by transfer the medicines in gum furrow. They are made of 100% cotton fibers and have a high level of absorption, flexibility and resilience. There are three types of dental cords: untwisted, braided and Ultrapak knit. A study of the structure and properties of makes it possible to apply it in dentistry practice. The parallel location of fibers, the pointed adhesive connection between them, and their stringlike shape ensure high-adsorption properties and the possibility of employment of the yarn as dental flosses and retraction cords.

Auth.

7.D4.2. Human body gravity model. /T. Maglakelidze, M. Zakaraia/. Science and Technologies. – 2010. - #4-6. – pp. 52-56. – geo., abs.: eng., rus.

Experimental wearing of footwear is one of the expensive, complex and long-term processes. An alternative to it is considered an idea to develop and introduce of a footwear imitation device under laboratory conditions. Within the framework of the given work, the quantitative and qualitative characteristics of this device and factors influencing them have been determined. In addition, the scope of problems, the resolving of which should create the preconditions for designing a new device was outlined. Based of an analysis of the literary data, all the loads acting on the foot at walking were identified, and the principle scheme of the device operation developed. In compliance with human body gravity, two options of loading the last were proposed: one with the centrally arranged load, another with distributed loadsa.

Auth.

7.D4.3. A mathematical model of vegetable products storage. /A. Tvalchrelidze, S. Tevdoradze/. Science and Technologies. – 2010. - #4-6. – pp. 57-60. – geo., abs.: eng., rus.
The methods of mathematical modeling enable to deeply study the mechanical, mass-transfer, heat and biochemical processes taking place during storage, their influences on the quality of stored product, and to scientifically determine the optimal storage conditions for various products. A mathematical model of vegetables storage under conditions of active forced ventilation is considered.

Auth.

7.D4.4. Determination of best performance of robot-controlled selective tea picking system by computer experiments. /G. Lezhava, I. Kamkamidze, Z. Berikishvili, T. Dalakishvili, A. Vardosanidze, E. Mkrtychian/. Science and Technologies. – 2010. - #7-9. – pp. 8-13. – geo., abs.: eng., rus.
The article describes a simulation model of a tea bush leaf stock growth and of tea leaf picking process by a robot-controlled system. The simulation program's operation results are found to be in good conformity with the real plantation tea leaf gathering. The program allows carrying out research and developing the picking tactics for different conditions of a plantation and for the different purposes. It is shown that computer experiments allow for comparing various tactics of gathering by a certain criterion.

Auth.

7.D4.5. Simulation of a polymer film making process by blown extrusion method: boundary problem and numerical algorithm. /Sh. Sagrishvili/. Science and Technologies. – 2010. - #7-9. – pp. 85-91. – geo., abs.: eng., rus.
The article considers a simulator of a sleeve-type film blow-forming process that enables to get a kinetic description of deformed-strength condition of the blown film and research the impact of structural and technological parameters on the process and a complex of the physical and mechanical data of the ready film. In practical applications, the simulator generally represents a two-point boundary problem for a system of common nonlinear differential equations. The preliminary results of the numerical experiment evidenced increased sensitivity of differential equations to changes of boundary conditions. The proposed adaptation of the parallel cannon method to the motion method parameters allows coping with the accounting difficulties.

Auth.

7.D4.6. Simulation of the non-stationary rectification process of ethyl alcohol with impurities. /A. Tvalchrelidze, L. Sichinava, I. Ebanoidze/. Science and Technologies. – 2010. - #7-9. – pp. 97-102. – geo., abs.: eng., rus.
The article considers simulation of the rectification process of ethyl alcohol with impurities, proposes a way of construction of thermodynamic functions and describes mass-exchange between the liquid and steam. The results of simulation of the alcohol-water solution rectification process with impurities of furfural with launching of the column are given.

Auth.

7.D4.7. Dynamic demand–supply model. /V. Mdzinarishvili/. Science and Life. - 2010 - №1. - pp. 51-54. - rus.; abs.: geo., rus., eng.
A dynamic demand – supply model is developed. A system of differential equation is offered, the solving of which enables obtaining the demand–supply simulator. The parameters of the simulator represent economic characteristics. Two differential equations describing the model are not interdependent variables. They are dependent only by parameters.

Auth.

7.D4.8. On the study of a positive prolonged effect of natural zeolites on grape yield. /T. Andronikashvili, M. Gamisonia, L. Eprikashvili/. Bulletin of the Georgian National Academy of Science. – 2010. – vol. 4. - #1. – pp.111-113. – eng.; abs.: geo., eng.
It is shown that depending on the type of natural zeolite, the respective organo-zeolitic fertilizer applied in vineyards and the prolongation period, the grape yield increases against the control by 1.8-2.8 times, grape juice sugar content - by i5-27%, while the acidity decreases from pH=3.75 to 4.52.

Auth.

7.D4.9. Influence of thermal and radiate ageing on physico-mechanical properties of the structurated butadiene-styrene rubber sole matherials for orthopedic footwear of diabetic patients. /M. Shalamberidze, N. Lomtadze, M. Grdzelidze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #3. – pp. 414. – rus.; abs.: geo., eng.
The results of investigation of thermal and radiate ageing on the structured butadiene-styrene rubber CKC-30 APK and CKC-30 APKM-15 with latent hardener and sulfurous vulcanizations are described. The experiment showed that polymers on the basis of LO-3 latent hardener have better deformation and strength characteristics than the corresponding sulfurous vulcanization polymers.

Auth.

7.D4.10. Influence of zeolites on the germination of alfalfa and sorrel. /M. Zautashvili, T. Kordzakhia, N. Pirtskhalava, N. Burkiashvili, I. Rubashvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #4. – pp. 478-483. – rus.; abs.: geo., eng.
The influence of natural sedimentary zeolites, clinoptilolite and analcime, and synthetic zeolite CaA on the sowing effect of alfalfa and sorrel seeds has been investigated under laboratory conditions. The positive effects of the above minerals on the biometric indices of these crops have been shown.

Auth.

7.D4.11. Research of the content of some heavy metals in hair samples of the residents of major cities using methods of differential-impulsive polarography and x-ray fluorescence spectroscopy. /T. Chelidze, L. Enukidze, M. Chankashvili, N. Khavtasi, I. Kharischarishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #4. – pp. 488-493. – rus.; abs.: geo., eng.
Using methods of differential-impulsive polarography and X-ray fluorescence spectroscopy, a research of the content of some heavy metals in the samples of hair taken from residents of big cities (Tbilisi, Mtskheta, Rustavi, Batumi, Kutaisi, and Zestaponi) was carried out. It is assumed that for some micro-elements deviations from their standards concentration in the samples of hair taken from the inhabitants of the above cities depend on the person's diet rather than on the level of environmental pollution.

Auth.

7.D4.12. New long-acting preparations against ticks. /O. Lomtadze, M. Jgenti, G. Chimakadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #4. – pp. 540-543. – rus.; abs.: geo., eng.
Various dosage forms (mixture, powder, liniment, pencil, suspension, emulsion) of preparations against ticks have been prepared. The prolonged miticidal action of dosage forms - powder, liniment and pencil - are due to the fact that natural aluminosilicates (clinoptilolite, montmorollonite clay) are used in making them. The properties and composition of the new preparations in fighting ticks are described in detail.

Auth.

7.D4.13. Technology for diagnostics and technique for the analysis of the condition of the tank bottoms of terminals for oil and oil-product storage. /L. Gavasheli, L. Makharadze, T. Medzvelia/. Mining Journal. – 2009. - #1(22). – pp. 48-50.eng.; abs.: geo., rus.
The paper discusses a technological innovation introduced for diagnostics and technique for fault detection of high-capacity tank bottoms of terminals for storage of oil and oil products. The technology has been developed on the basis of the acoustic emission method of calling for forced response, implying diagnostics of both the walls and bottom of tanks, ultrasonic inspection and thickness gauging to be performed without any interruption in the facilities' functioning. It will ensure pursuing nondestructive control as well as prompt/precise revealing, classification, definition of the nature, geometrical sizes and location of defects. The effectiveness and accuracy of the technology herein presented has been verified by full-scale studies carried out on industrial installations.

Auth.

7.D4.14. Elaboration of new ecologically safe, high efficient fire-extinguishing powders based on perlites, zeolites and clay shales. /L. Gurchumelia, F. Bejanov , D. Petviashvili, L. Tkemaladze, N. Bekauri/. Mining Journal. – 2010. – #1(24). – pp. 90-94. – rus.; abs.: geo., eng.
The traditional methods of fire-extinguishing are still expensive and low effective. Therefore, the use of powder fire-extinguishers is very effective, because they are considered to be the unique means to be used in practice for extinguishing any type of fire both in underground and above-ground structures. At the same time, it should be noted that powders of serial production slightly differ from one another. Most of them are halogen-containing and do not meet modern requirements, primarily from the viewpoint of efficient and universal use. Therefore, one of the most important problems at present is the elaboration of halogen-free and inexpensive fire extinguishing powders. The work is devoted to the ways of development of halogen-free, ecologically safe, high-efficient, and cheep universal fire extinguishing powders based on local mineral raw materials: zeolites, perlites and clay shales, which do not require further chemical processing and modification with halogen-containing, organogenic water-repellent additives.

Auth.

7.D4.15. Proposals for foundation of a nanotechnology center in Georgia. /R. Chikovani/. Nano Studies. - 2010 - №2. – pp. 103-118. - rus.; abs.: geo., eng.
The article is devoted to the prospects of the development of nanotechnology in Georgia. Section 1 presents a brief overview of the nanotechnology development in general, its characterization, already obtained results and actual perspectives. There are shown possibilities of nanotechnological applications of in various fields of human activities. It is stated that nanotechnology should radically change whole human life in future. It is emphasized that number of nations has adopted their programs on development of nanotechnology. In Section 2, there are considered issues of development of nanotechnology in Georgia. The perspectives are shown and the factors are analyzed those favor the further development. In addition, some proposals are expressed with regard to formation of the sharing nanotechnology center in Georgia and training of its personnel.

Auth.

7.D4.16. The methodology of simulation of physical experiments of criminological technology and equipment. /G. Janelidze, N. Esiava, A. Janelidze, R. Esiava/. Newsletters of Academy of Education Science of Georgia. – 2010. - # 2(17). – pp. 148-151. – geo., abs.: rus., eng.
The fundamental stages and development lines of the theory and practice of application of simulation technique in criminalistics are considered. Various options of communication models are proposed, information relations and computer-based documents in criminalistic activities are determined and described, their essene and legal regulation issues are defined.

M. Kopaleishvili

7.D4.17. Automated system of experimental researches in infrared moisture measurement. /Ts. Nozadze/. Materials of Sukhishvili University International Scientific Conference. – 2010. – pp. 481-484. - geo.; abs.: geo., eng.
The report provides some methodical principles of organization of experimental researches by definition of a mathematical model for measurement of humidity in different materials. The structure of the automated system of experimental researches and methodical scheme of realization of experiment is offered. The spheres of application of experimental system for solving certain tasks in infrared moisture measurement are offered.

Auth.

7.D4.18. Generation of differential equation for the dangerous sliding surface of landslide-affected slope and its study considering additional loads. /T. Kvitsiani, G. Khutsishvili, T. Gardaphkhadze/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 157-165. – geo., abs.: geo., eng., rus.
The work deals with the stability of a slope when the slope massif, in addition to its own weight, is subject to blast and seismic forces. An ordinary first-order differential equation has been drafted describing a relatively dangerous smooth curved surface of sliding the sliding mass of the slope. The solution to this equation is given as quadratures, and in some cases – as elementary functions which allows identifying the zones of collapse in the sliding mass.

Auth.

7.D4.19. Mathematical modelling of hydro-ecological processes during changeable boundary conditions and their computer simulation. /R. Kiladze/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 172-177. – geo., abs.: geo., eng., rus.
The paper includes a mathematical description of hydro-ecological processes (flow caused by sediments, surface and flow irrigation, infiltration etc.). These processes, as a rule, are multistage with different boundary conditions; the moment of their change is not known preliminarily and depends on the process course. A complete theoretical base in the form of differential equations of the uncontrolled motion of water flow (taking into account infiltration) should be used to provide computer simulation of such difficult processes, and numerical methods (finite-dimensional) – to sum the system, which can allow us to bind and unite different stage of process.

Auth.

7.D4.20. Stability of sprinkling machines when working on slopes. /O. Nanitashvili, E. Rekhviashvili, V. Nanitashvili/. Collected Papers of the Institute of Water Management. – 2009. - #64. – pp. 197-200. rus., abs.: geo., eng., rus.
The paper describes the stability of a sprinkling machine working on a slope. On the basis of the force-moment balance equation, a dependence and diagram to determine critical angles for the dynamic stability of sprinkling machine are determined.

Auth.

Search by Authour

Search by Topic