

REVIEW OF THE LECTURES OF METALLURGY AND RELATED TOPICS - SECTION "D"

93 contributions have been received for Section D on Metallurgy and related topics. The most numerous are the contributions of the scientists from Slovakia (58), Ukraine (22), Croatia (15), Poland (7), Russia (4) and s. o. With the exception of four contributions presented from enterprises, the rest of them are results of scientific work in research and educational institutes. Topics of section D are:

- marketing and management in metallurgical and mining enterprises (contributes no. **1-19**);
- mineral engineering (contributions no. **20-29**);
- energy sources (contributes no. **30-50**);
- environment pollution (contributes no. **51-63**);
- heat transfer (contributes no. **64-75**);
- science on materials (contributes no. **76-82**);
- computer science (contributes no. **83-86**);
- other applications (contributes no. **87-93**).

Marketing and management in metallurgical and mining enterprises. Discounted cash flow (DCF) assessment method and its use in assessing a producer company is presented in paper no. **1**. Contribution no. **2** deals with problems of bankruptcy forecasting of industrial enterprises based on the analyses of capital circulation. The topic of paper no. **3** is the financial stability evaluation with regard to the liquidity indicators in the area of heavy industry. The article no. **4** deals with possibility to improve financial and economical management in the chosen firm, mainly through financial and marketing controlling. The aim of the paper no. **5** is to make the public familiar with results of the evaluation of the incomplete working costs at the ŽDAS, a. s. electric steel making plant. Economical studies assume annual exploitation of one prospector from 700 thousands ton to 3 millions ton from seabed deposit of polymetallic concretions (no. **6**). In the year 1994 the International organ for seabed was established, with its premises on Jamaica, the Slovak republic being its regular member (no. **7**). In the article no. **8** the purchase policy and supply aspects of logistics in strategic materials in a metallurgical enterprise are introduced. Physical flow process of materials stream in the production process in one of the Polish rolling mills, and also its logistics analysis and cost analysis is presented (no. **9**). The development of the production management using the ISO standard is presented in papers no. **10** and **11**. Restructuring of metallurgical industry in aspect of economics - the system changes and the integration in the European Union, based on analysis of polish metallurgical industry in 1991 - 2005 - is presented in paper no. **12**. Papers no. **13** and **14** deal with introduction of Computer Integrated Manufacturing method in design and its application in engineering industry. The "hyper-project" - a method to advance the innovation-oriented scientific developments to market - is presented in paper no. **15**. Contribution no. **16** presents an example of method of proceeding in analysis and modification of human resource management system. In paper no. **17** an example of procedure of life and objectify work effectiveness analysis in metallurgical enterprise is presented. The main aim of contribution no. 18 is to describe facilities of increase productivity of the process in a rotary kiln for the firing magnesite clinker. Application of statistical quality control in the metallurgical process is the topic of contribution no. **19**.

Mineral engineering. Demonstration of alpine structural phenomena at structure of magnesite deposit Jelšava - Dúbrava Massif is presented in paper no. **20**. The contribution no. **21** deals with application of geo statistics at modeling mineral raw materials' deposits. Papers no. **22**, **23** and **24** present utilization of acoustic methods in identification process by optimal control of rotary drilling. Level deformation investigation of the point of the monitoring station stabled in the fill slope territory Košická Nová Ves, is the main task of the paper no. **25**. Papers from no. **26** to **28** deal with creating geographic information systems GIS using different methods as GPS, remote sensing and geostatic. Possibilities of using the GIS tools in the evaluation of ground water sources in Hornád Basin are presented in paper no. **29**.

Energy sources. Review of perspective technologies in power engineering is presented in paper no. **30**. Development of arrangements and exploration, connected with increasing of heat supply system effectiveness of the industrial enterprises in an example of tyre manufacturing is presented (no. **31**). The comparative analysis of efficient application

of alternative and traditional energy sources in the industry in the world and in Ukraine is executed (no. 32). Geothermal energy is a significant local energy source and Slovakia has very good conditions for exploitation of this energy (no. 33, 34, 35). Solar system energy gain analysis and its influence on absorber's surface area dimensioning are presented in paper no. 36. The use of solar collectors, which are assembled on the balcony railings of an urban built-up area of block of flats, is presented in paper no. 37, as an advantageous choice for renewable energy on large-scale implementations. Slovakia, as an inland country, disposes essentially of lower wind energy potential if compared to western European countries. To overcome this disadvantage a wind pneumatic accumulation storage system was developed (no. 38 to 44), where wind energy serves as the primary resource. Biomass utilization possibilities for public edifice heating (no. 45) and potential of biomass improvement in Slovakia (no. 46) are presented. Papers no. 47 and 48 present a combined heating system in Pavilion Delius. Paper no. 49 deals with diagnostics of pipelines system of the underground gas storage in Slovakia. Mathematical model operation of formation and fracture of sedimentation on devices of constructions to reduce breaks in electro supply was developed (no. 50).

Environment pollution. In contributions no. 51 and 52 the problem of optimal control by an ecological process with free boundary, when it is required to operate the concentration of environmental contamination caused by a dot source of pollution of intensity, is considered. Within the framework of "Corporate Responsibility for Environment Protection", Steel Authority of India Limited has prepared a road map for progressive improvement of its environmental performance (no. 53). Serpentine heaps in the surroundings of Dobšina are a long-life ecological problem of the city and at the same time a suitable raw material for production of $MgCl_2$ and SiO_2 (no. 54). Contribution no. 55 deals with utilization of industrial wastes, especially from mining and metallurgical enterprises. In a case of non-ability to treat the anthropogenetic waste as secondary raw material, which passed the technological processes, there is the ability of saving the environment with other approaches e.g.: grass-covering, forestation, sprawling out, etc. (no. 56). In order to analyze some aspects related to complex relations between a metallurgical system and its environment, the paper no. 57 starts with an idea about the possibilities of practical applications of the neural networks. In the presented paper no. 58 a magnesite firm with its influence on the living environment is analysed, regarding the air pollution, water pollution and soil pollution. Protection of ground water sources, mineral and thermal water as a part of environmental protection is topic of paper no. 59. Crushed zeolite is applied as a filter media for decontamination of ground water (Rimavska Sobota casern - East Slovakia) (no. 60), as well in the improvement of the air quality in a dressing-room of Slovmag Lubenik Mine (East Slovakia) (no. 61). In contribution no. 62 the method of air pollution mapping and quantitative analysis of the second greatest city of Slovakia, Košice, is described. A rapid form of silicosis after four years of work in Humel Gallery (East Slovakia) was detected (no. 63).

Heat transfer. Systems for indirect measurement of temperature (no. 64, 65), conductivity (no. 66) and heat flow (no. 67) are presented. A method for estimation of the specific heat capacity of materials, based on direct measurement of the temperatures of the material and surrounding zones in the furnace, is topic of paper 68. Numerical calculation of radiation heating in vacuum is presented in paper no. 69. Asymptotic analysis of heat conduction in thin layers is topic of paper no. 70. Three models of contact thermal resistance for managerial processes by thermal conditions of metallurgical manufacture are shown (no. 71). Mathematical model operation of heat exchange in view of thermal storage is presented in paper no. 72. Mathematical modelling and research of heat exchange at the heatstroke is topic of paper 73. Contributions no. 74 and 75 represent the solutions of unsteady heat conduction problem with unified external boundary conditions and non-ideal heat contact conditions for metallurgical equipment heatproof coverings and the systematic analyses of different physical fields influence on the construction elements.

Material science. In the paper no. 76 the results of the investigation on surface layer of carbonized X150CrMoV12-1 tool steel is presented. Paper no. 77 deals with aims and problems of space metallurgy. Topic of paper no. 78 is segregation phenomena in phase transition in multi component media in microgravity. Fusibility of natural materials as a function of their chemical and mineralogical composition is discussed in contribution no. 79. Within the paper no. 80 the constructive principles of an original new installation, for testing at quick (seconds order) thermal shock is presented. Mathematical model operation and calculation of thermal processes at laser handling coats is presented in paper no. 81. The work no. 82 brings up theoretical and practical results of the study of the effect of water on mullite building materials installed in the body of the chimney.

Computer science. Protecting information from unauthorized access on a computer network is considered the task of the firewall on base of operating system Linux (no. 83). Realization of protection of a network at application level is considered the task of the floodgate of applied level on base of Layer 7 Classifier, with use of the kernel of operating system

Linux (no. **84**). Using spatial data in network oriented computer systems is the topic of contribution no. **85**. A contribution to programming numeric control led machines through the use of macros is presented in paper no. **86**.

Other applications. Numeric solution method of eigenvalue problem of the absolutely flexible pipeline located in the water stream and containing the concentrated masses as floats is offered (no. **87**). The results of computations of frequencies and forms of eigen oscillations of the hydrotransport pipeline, which is contained in deep-sea mining installation, are presented in paper no. **88**. Application of enriched natural zeolites substratum for ecological agricultural products, in order to provide higher production of plants, is topic of paper **89**. Application of rental dross in phosphatic coldly hardening mixtures for making of forms lost wax process is presented in paper no. **90**. Artificial neural network for maintenance planning of metallurgical equipment in the enterprise Aluminij d. d. Mostar was developed (no. **91**). The new version of a method of component-wise splitting of heightened accuracy for calculation nonstationary thermoelasticplastic of station of thin-wall units of shell is offered (no. **92**). Contribution no. **93** presents Impol, d.o.o., a world-class supplier of free machining aluminium alloys of exceptional quality and excellent machinability characteristics.