UNIVERSITATEA DE NORD DIN BAIA MARE

FACULTATEA DE RESURSE MINERALE ŞI MEDIU

BULETIN ŞTIINŢIFIC AL UNIVERSITĂŢII DE NORD DIN BAIA MARE

SERIA D
Exploatări Miniere
Prepararea Substanţelor Minerale Utile
Metalurgie Neferoasă
Geologie şi Ingineria Mediului
Volumul XXIII

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ECOTOXICOLOGICAL TESTS ON CYANIDE TOXICITY IN AQUATIC ENVIRONMENT

V. OROS, A. FAGE
North University of Baia Mare, Romania

ABSTRACT: *In this paper, we carried out tests of acute toxicity with potassium cyanide solutions on individuals of Daphnia sp. and on a mixed population of algae. The following concentrations were used in the experiments with Daphnia: 0.01 mg/L (P1); 0.05 mg/L (P2); 0.25 mg/L (P3); 1.25 mg/L (P4); 6.25 mg/L (P5). For concentrations such as 0.01 mg/L and 0.05 mg/L potassium cyanide has a weak toxic effect on Daphnia for a 24 hrs exposure. Death rate starts to appear after 48 hrs of exposure (16%, respectively 41%). For 96 hrs of exposure, death rate increases to 58%, respectively to 83%. The average lethal duration TL_{50} is 88 hrs for a 0.01 mg/L concentration and respectively 60 hrs for a 0.05 mg/L concentration. It is notable that the evolution of toxicity for a 0.25mg/L concentration is similar to that of the previous one (0,05 mg/L), the only difference being that the death rate starts quicker, with 16% for a 24 hrs exposure. The values recorded after 48 and 96 hrs of exposure are virtually the same. For higher concentrations (over 1 mg/L), the toxicity of cyanide for Daphnia is obvious. For a 1.25 mg/L concentration, after 6 hrs of exposure, the death rate increases abruptly up to 75% during the first 24 hrs. The estimated TL_{50} value for this concentration is 16 hrs. Potassium cyanide is extremely toxic for Daphnia at a 6.25 mg/L concentration. Consequently, 6 hrs after exposure the death rate is 83%, the TL_{50} value being under 6 hrs.*
The tests carried out show that the average lethal concentration (CL_{50} value) for a 48 hrs exposure is CL_{50}=0.30mg/L. For algae, cyanide is less toxic. Results show that an inhibition of the algae development appears after 24 hrs of exposure, a difference of 30% being noticed in comparison to the witness test. Observations indicate that after 96 hrs of exposure a partial inhibition of algae development appears according to concentration, and for a 6.25 mg/L KCN concentration the algae development is stopped. However, after 14 days, algae developed even for P5 version, the inhibition degree being of 20% compared to the witness version.

KEYWORDS: *toxicity, test, Daphnia, cyanide, algae*

MINE WATER TREATMENT CAVNIC, AFTER CLOSING THE PERIMETER OF THE MINING ACTIVITY

D. BACIU, S. COZMUŢA
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ABSTRACT: *Laboratory experiments have concerned the treatment of Cavnic mine water with solution of Ca(OH)2 10%, without addition and with addition of floculation. In conclusion we can say that the combined method for using the solution of 1ml Polias730/ 1 l treated water $Ca(OH)_2$ 10% , is optimal for treating acid mine water, as it is the method that meets the most effective conditions, both in terms of economy of solution and of the results: only 8% of decanted sludge at a sedimentation rate of 0.16 mm/s.*

KEYWORDS: *mine waters, pH, hydrated lime, neutralization, precipitation*

EFFICIENCY OF COMPOST-FILLED PASSIVE BIOREACTORS FOR THE TREATMENT OF HIGHLY CONTAMINATED ACID MINE DRAINAGE

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ABSTRACT: *Acid mine drainage (AMD) contaminated waters, characterized by low pH and high concentrations of metals and sulfate, are the number one issue of mining industry around the world and a very challenging environmental problems of the 21st century. The AMD need treatment before being discharged into the environment. Composed-based passive bioreactors offer one of the most sustainable solutions to the AMD problem, due to their numerous advantages. Among these, the use of natural organic materials (inexpensive and largely available) in the filling-mixture of passive bioreactors, and the precipitation of metals in their most stable form (sulfides) make this technology very attractive for the mining industry. Over the last 20 years, experience showed that passive bioreactor can be successfully used for the treatment of slightly contaminated AMD. Moreover, a very recent extensive study showed that this technology can also be effective for the treatment of highly contaminated AMD (pH 2.9 - 5.7, 500 mg/L Fe, 10 mg/L Mn, 10 mg/L Cd, 14 mg/L Ni, and 15 mg/L Zn). Laboratory column bioreactors, operated for up to 15 months increased the pH of AMD to around 6 and removed metals (60-82% for Fe and up to 99.9% for Cd, Ni, and Zn). However, long hydraulic retention times (HRTs) (7.3 days and 10 days) are required, involving large available space for the treatment system set-up and operation. Therefore, compost-based passive bioreactors can be used for the treatment of highly contaminated AMD, with respect to the required HRT and necessary space.*

Keywords*: Acid Mine Drainage (AMD), passive bioreactors, Sulfate-Reducing Bacteria (SRB), metal removal*

RESEARCH OF PHYTOREMEDIATION ON BOZANTA TAILING POND

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ABSTRACT: *The paper follows the development, implementation, tests and demonstrates the usefulness of a experimentalmodel of phytoremediation on the Bozanta ore pond, which includes a set of operations to rehabilitate the biological recultivation, regular monitoring and laboratory analysis during the vegetation period 2008-2009. After analysis of the site characteristics, resilience and the presence of species already adapted to conditions on the ground we chose the following species for the phytoremediation process: birch, oak, poplar and willow. The project started in March 2008 by planting 295 saplings of the species mentioned above on the Bozânta pond site and in laboratory, in 6 pots with sterile ore from the pond, 3 birches and 3 oaks were planted. Planting was done directly on the site without using soil amendments or mixed soil, on three levels in the eastern embankment of the pond, the last step being the upper part of the plateau. Monitoring of seedlings has been done in different vegetation states of 2008 and 2009 by recording the number of remaining saplings of each species, measuring air and soil temperature on each step, measuring the height and trunk diameter of each sample and the results from the year 2009 have been represented graphically by comparison the results (mortality, diameter and height) obtained in 2008.*
The mortality rate in June 2009 to June 2008 compared with poplar and oak increased by about 45.5%, for willow by 35% and the smallest of 12% was recorded in birch. From measurements made on site we can record a progressive increase in both diameter and height for poplar and birch and a stagnation in oak and willow. From the laboratory measurements made, the birch had a better and faster development both in diameter and in height compared to oak which had a slower development. Regarding the presence of microorganisms we analyzed in the laboratory samples taken from the field (soil + root) each species separately. Results showed that birch had a more diversified and rich microbial growth weaker in oak which also stands out from the increase in their height and diameter. Development of the planted species on the Bozânta pond is possible and this is apparent from the results presented above, after a year and a half after planting the birch samples adapted best to the existing conditions on site, followed by willow , poplar and oak on the last place .

KEYWORDS*: phytoremediation, tailing pond, plant growing*

ACTUAL OPORTUNITIES FOR AN INDUSTRIAL ECOLOGY AND ITS VALUE FOR THE SUSTAINABLE DEVELOPMENT

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ABSTRACT: *The paper presents in detail the industrial and "Industrial Green Game" ecological concepts. The production systems of nowadays are being taken as parts of the local ecosystem and biosphere. All considered, from an ecological point of view, the production systems must follow the model of natural ecosystems, while functioning they must not produce pollution. Industrial environmentalists are interested more and more in the evolution of industrial ecosystems taking the problem from different points of view: how do they work, the impact on environment, the climate changes and the changes that legislation must suffer. Also, the paper debates on "Industrial Green Game" concept: an idea that considers production and consume as an indivisible structure. But the context in which the "Industrial Green Game" is applied is dynamic, very complex and it can not be measured with precision in environment expenses neither on long term, nor on short term.*

KEYWORDS: *industrial ecology, industrial green game, environmental integrated management*

ASSESSEMENT OF THE BIODIVERSITY AND GEODIVERSITY OF THE REGION OF BAIA MARE CLAIMING FOR AN INTEGRATED MANAGEMENT

R. ŢANDEA, A. FÜLÖP
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ABSTRACT: *The region of Baia Mare, overlapping the area of the Gutâi Mts. shows an outstanding geodiversity and biodiversity. The region developed on the basis of the mining activity which had a strong negative impact on the environment but sustained economically the inhabitants for many centuries. During the last twenty years, the decline of the mining activity changed dramatically the life of the local communities. Searching for alternatives, in the light of the sustainable development, the management of the geodiversity and biodiversity could account for the future development of the region. The environmental rehabilitation as well as the focus on the natural potential of the region creates new opportunities. An integrated management of the natural heritage is a must. Among the objectives, the promotion of a geoturistic network developed around the two concepts of geodiversity and biodiversity as part of the holistic concept of natural heritage; combined with the cultural heritage of the region, they could enhance the local, specific character, being also beneficial for the local communities.*

KEY WORDS: *region of Baia Mare, geodiversity, biodiversity, natural heritage, integrated management, geotourism, sustainable development.*

STUDIES ABOUT DETOXIFICATION WAYS ON WASTEWATER WITH CYANIDE RESULTING FROM PROCESSING GOLD ORES

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ABSTRACT: *Maramures is an county with ancient tradition to get gold and silver from nonferrous ore. In gold mining operations have use dilute solutions of sodium cyanide (100-500 ppm). Usually, sodium cyanide is delivered directly in aqueous solution. After extraction of gold in wastewater compounds can exist 3 types of cyanide: free cyanide, weak and strong complexed cyanide. Together, all 3 types of cyanide in the form "total cyanide". Most chemical processes has*

follow destruction by oxidation of cyanogen (CN^-) on cyanate ion (OCN^-), which is less toxic, and further to harmless reaction products: nitrogen and carbon dioxide. After alignment with EU legislative requirements and to the Code of Management with Cyanide, cleaning technology with hydrogen peroxide has become official and classified as BAT. This paper contains a parallelism between two technologies about decontamination wastewater polluted with cyanide: chlorination and treatment with peroxide (hydrogen peroxide); all studies were made in laboratory.

KEYWORDS: *BAT, cyanide, totale cyanide, hypochlorite, hydrogen peroxide*

RESEARCH REGARDING THE EVOLUTION OF INTERURBAN TEMPERATURE IN BAIA MARE

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ABSTRACT: *Since 2007 at the North University from Baia Mare is running an Oregon Scientific WMR 100 type weather station which follows continuously the weather from the interurban region of the city. The variables which are measured by this weather station are various, starting from the basic temperature and humidity to a more complex heat index, rain, wind and others. The most important value measured is the temperature because these influences the human condition in the first time and according to this the weather station is set to record automatically this parameter minute by minute. The paper presents the evolution of the temperature during a period of a year starting from June 2008 and since June 2009. We choose this period because of the accuracyof the data's recorded and because this period is the most illustrative since the weather station is functioning. The data is represented detailed by seasons and the extremes are analyzed according to the cause which determined them, there is also represented the evolution of this parameter during the whole period and the results are given graphically.*

KEYWORDS: *interurban environment, temperature, meteorology*

SPECIES' EXTINCTION. PERSPECTIVES FROM SOURCE – SINK MATHEMATICAL MODEL

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ABSTRACT:*Where habitat loss and fragmentation is severe, many native species are likely to present reduced levels of dispersal between remnant populations. For those species to avoid regional extinction in fragmented landscapes, they must undergo some kind of metapopulation dynamics so that local extinctions are countered by recolonisation. The importance of spatial dynamics for regional survival means that research into metapopulation dynamics is essential. Therefore, every species and every population of a species is important in ecology and most of all when it comes to biodiversity conservation. The present theoretical study combines two relevant mathematical models (Pulliam (1988), Watkinson and Sutherland (1995)), existent at this time, in order to conclude with recommendations that have to be taken into consideration when the situation requires the establishment of a species conservational area.*

KEYWORDS*: population dynamics, source-sink model, conservation, biodiversity*

THE INFLUENCE OF METALS ON PLANT GERMINATION AND GROWTH

I. BEREŞ, V. OROS, A. FULOP
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ABSTRACT: *Experiments are conducted to measure the influence of certain metals (Zn, Fe, Cu) concentration in soil on plant germination and growth. The experiments are conducted for 3 weeks and they show a favourable influence of Zn for germination and Fe and Zn for growth. The metal mix at low concentrations seem to have positive influence both for germination and growth.*

KEYWORDS: *experiments, Zea mais, seeds, germination, Pb, Zn, Cu.*

SULPHATE PULP TREATMENT OF WASTE BATTERIES ENVIRONMENTAL TECHNOLOGIES

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ABSTRACT: *This study proposes the use of hydrometallurgical process for the treatment of lead-acid battery paste not pollution. One solution to the environmental problems associated with the direct smelting of lead-acid battery paste is to leach the associated lead with sodium hydroxide. Lead was separated from alkaline solution as $PbSO_4$ using H_2SO_4 as precipitation agent and transformation pure $PbSO_4$ in tribasic lead sulphate using NH_4OH as precipitation agent.*

KEYWORDS: *battery scrap, waste batteries, alkaline solution, tribasic lead sulfate, green technology*

EVACUATION AND FILTRATION SYSTEM OF THE HYGIENE GAS FROM THERMAL REFINING

J. JUHASZ[1], C. BUHROW[2], N. AFRIM-BĂNCILĂ[1], V. HOTEA[1], G. BĂDESCU[1], E. POP[1]
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ABSTRACT: *The filtration of the hygiene gas from thermal refining of copper is substantially improved due to the use of advanced technologies for filtering, using filters with bags[1]. The filter with bags consist of several compartments, each containing a large number of bags, suspended vertically in a metal lattice designed to maintain the bags open during gas filtration [11]. This method is superior gas filtering all known methods of filtering, because it has higher efficiency, unrivaled by other similar technologies.*

KEYWORDS: *Bag filters, thermal refining, low atmospheric pollution.*

RESEARCH WORKS OF EVALUATIONS AND DIMINISHMENT OF THE RISKS OF ACCIDENTS AT THE TAILINGS DEPOSITS WITH THE USE OF THE GEOSYNTHETIC MATERIALS

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ABSTRACT: *The diminishment of the risk of water contamination, of the impact upon human health and safety as well as of the aquatic ecosystem by the mining catastrophic accidents or pollutant leakages is a major objective for which a continuous preoccupation should exist.The evaluation and risk diminishment implies the expertise of each tailings deposit in the following domains: geotechnical, geological, hydro meteorological, hydro geological, constructions, operations, risk management and closing/rehabilitation of the settling ponds and tailings deposits, the risk evaluation/ failures and effects analysis, the safety of the ponds and deposits.The research works of evaluation and diminishment of the risk implies investigations needed by the creation of the model of balance of the water for the entire area and for an isolated system. Specific data of the analyzed area should be taken into consideration such as:*

-Meteorological data: temperature, precipitations and evaporation rate;

-Water levels: in the pond, outside the pond, and underground;

-Infiltrations: quantities, pollutant agents;

-Geochemical conditions of the materials of the ponds and dams;

-Underground geological conditions.

The geocomposites with mineral layer for insulation are tight boundaries with complex structure that use the strength of millions of fibres woven to encapsulate a layer of sodium bentonite with high inflation characteristic. This balanced combination of polymeric fibres and bentonite creates an insulating layer with excellent performance capable to undertake and transmit cutting efforts. Once hydrated, the geocomposite becomes a perfect barrier for liquids, vapours and gases. The applications that the geocomposite materials are fitted for are: tight barriers for contaminated soils; tight barrier under scrap deposits; protection layers for geo-membranes; tight barrier against vapours and gases; insulation for dams, channels and riverbeds; protection of the phreatic water; vertical barriers; recovering basins; secondary insulation; pits for collection of the hazardous residues.

The safety improvement and the management of the tailings deposits assumes their ecologization requiring immediate measures, new technologies with geosynthetic materials and joint international projects to protect water quality prevent ecological disasters and promote clean technologies within the context of a durable development.

KEY WORDS: *geosynthetic materials, tailings deposits, ecologization.*

STUDY OF THE OBTAINING OF GALLIUM-ALUMINIUM ALLOY USED FOR EXTRACTION OF GALLIUM FROM SODIUM ALUMINATES SOLUTIONS RESULTED IN BAYER PROCESS

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ABSTRACT: *In the present paper is presented the study of obtaining of gallium-aluminium alloy (aluminium gallama) used for gallium extraction from sodium aluminates solutions by cementation method. Cementation is the term used for describing the process in which a metal from a solution of his salt is precipitated through another metal more electropositive. Technical aluminium, obtained by processing the bauxites, contains till 0.01%Ga. Gallium influence in such quantity upon aluminium properties is insignificant. There were studied the thermodynamic properties of the alloys. The introducing of few percents of Ga in Al leads to the increasing of strength and durability of Al but the aluminium alloys are not susceptible at heat treatments and have a low corrosion resistance. The obtaining of gallium-aluminium alloys has been made taking into account the Ga-Al equilibrium diagram.*

KEY WORDS: *gallium-aluminium alloy, cementation, sodium aluminates solutions*

MICROSTRUCTURAL CHARACTERISATION OF Al/SiC COMPOSITES PROCESS BY POWDER METALLURGY

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ABSTRACT: *Materials used in the aircraft and automotive industries involve applications at high-temperature. Recently, metal matrix composites have emerged as a promising class of materials, especially aluminium composites with their lightweight, reliability and low cost compared to more exotic materials such as organic composites.*
Al-matrix composites like Al/SiC have been process by powder metallurgy route, using SiC powder and Al powder at different work temperature: 1100^0C, 1300^0C, 1450^0C and 1750^0C. Optical microscopy analysis reveals the small particles surrounding in metallic matrix. At the interface between particles and metallic matrix we observed an interface films. Scanning electron microscopy and energy dispersive X-ray analyses were made in order to determine the elemental composition of the samples. Al and O were found in metallic matrix, Al, C, O and Si were found in interface films and Si and C were found in particles. In order to determine the sample's compounds, X-ray diffraction analyses were performed. Depending on the temperature of the process, the following phases were identified in the samples: Al, Al_2O_3, Al_4C_3, Al_4O_4C, Al_4C_4Si, SiO_2 and SiC. Analyzing the results obtained by different techniques, the optimization of the obtaining route was done.

KEYWORDS: *ceramic composites, powder metallurgy, XRD, SEM*

ADJUSTMENT OF THE AIR RESISTANCES OF THE CIRCUITS OF A VENTILATION NETWORK WITH A DIAGONAL IN ORDER TO STABILIZE THE CONSTANT DISTRIBUTION OF THE AIRFLOW

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ABSTRACT: *This paper presents a method of analysis of the features of the ventilation network with a diagonal and the calculation of the air resistance of the network, as well as the distribution coefficients of the airflow in the circuit components. The network with a single diagonal is considered as a construction composed of three modules. The module from the middle part of the network (M_2), as known, allows the calculation of the distribution coefficients of the airflows. The relationships between the modules are known as well, thereby, the air resistance of the network can be calculatated. The paper is addressed to researchers, designers and engineers of ventilation systems in the mines, as well as to the students in Mining Engineering. We are going to achieve a mathematical model aimed to facilitate the solving of the problem of complex ventilation networks.*

KEYWORDS: *air resistance, ventilation network, air circuit, modul of ventilation network, air node network, airflow, airflow distribution, depression*

MINING WASTE STABILITY IN ILBA CICÂRLĂU MINING PERIMETER

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ABSTRACT: *The Ilba - Cicârlău mining perimeter is very affected by mining works developed in the area and the huge quantity of mining waste produced and deposed in mining waste deposits. There are 44 mining waste deposits, in a total surface of 8,52 ha and a volume of 319 000 m^3, the deposits are placed on the bottom of the hill slope and, quite often, the inferior side is placed in contact with valleys, so, the access roads to the mining deposits are destroyed by water flowing on the slopes. As a conclusion of our study, we proposed technical solutions for each deposit, to assure physical and chemical stability, to restore these areas in natural landscape and diminish the environmental impact.*

KEYWORDS: *mining wastes, acid drainage, stability, safe coefficient, technical solutions, environmental impact, natural environment, limit stability*

THE OPTIMIZATION OF THE MATHEMATICAL MODEL FOR PROTECTION PAD DESIGN OF THE SUBLEVEL MINING METHOD

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ABSTRACT: *This paper presents the design of protection pad by means of a mathematical model which is based on a non lineary programming of three influence factors. The efforts upon the sublevel bench is considered as a dynamical gravitational system having as influence factors : the falling hight or the rock block, the weight of it and the double share force of the sublevel bench. These factors have been determined experimentally by means of mathematical model ay fix scale.*

KEYWORDS: *optimization, mathematical model design, protection pad, sublevel, bench.*

A WAY TO IMPROVE THE TECHNOLOGICAL RESULTS OF THE CYANIDING PROCESS - THE SULPHITE-AIR METHOD

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ABSTRACT: *Residual flotation reagents from the gold-bearing pyrites subjected to cyanidation (xanthates mainly), by gold particles surfaces hydrophobisation, hinder the sodium cyanide's access thus retarding this one's dissolution in the same time with the increase of the cyanide specific consumption and with the worsening of the process' technological results.*
The paper presents some experiments made in order to eliminate these deficiencies, by the modification of the mineral surfaces' properties at the mineral / cyanide solution interface due to the gold-bearing pyrites' pretreatment with sodium sulphite in the presence of air.
The experiments emphasized the correlation between the Eh-pH variation diagram, the remanent collector consumption in the liquid phase and the cyanidation process' parameters.

KEY-WORDS: *Cyanidation, surface properties*

ROLE OF METALLIC ELECTRODES IN FLOTATION ACTIVATION PHENOMENA

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ABSTRACT: *This paper presents the researches for using copper electrodes to activate sphalerite instead of copper sulphate. The flotation tests were done in order to establish the optimum reagents regime as standard flotation tests, and to establish the optimum reagents regime using anodic dissolution of metallic electrodes. The treatment within the electric field was done during the entire flotation process, the role of the electrochemical treatment being not only for the activation or depression of the minerals but also as a positive influence on the entire flotation process. In order to find the optimum reagents regime was used the gradient method which is a mathematical statistic model of factorial planning for the laboratory tests , the rise to the line of greatest slope. The method treats the simultaneous change for all the factors, and reduces substantially the tests number and the time necessary for reaching the area of optimal. The advantages of replacing copper sulphate with copper electrodes results from the appreciably decrease of expensive reagents consumptions, increase of metal recoveries and metal contents in the collective concentrate. By using the gradient method was successful as a small number of tests to determine optimum reagent consumtions that ensure the suitable technological indicators. Information and data that are obtained using the gradient method, including established mathematical correlations, can serve to develop models of minerals processing, which in turn can be used to automate the process.*
KEYWORDS: *flotation, activation, metallic electrodes*

PALEOENVIRONMENT AND GEOMORPHODYNAMIC IN THE EOCENE LIMESTONE OF PRISLOP CATCHMENT (BOIU-GÂLGĂU PLATEAU, MARAMUREŞ COUNTY)

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North University of Baia Mare

ABSTRACT: *Prislop Valley River Basin is located on the north-western side of the Boiu-Gâlgău plateau. These observations are based on the morphology of fossil organisms found in Eocene limestone, which reflect their way of adapting to the environment in which they lived. The Prislop* Catchment *includes a series of specific factors common to exhumed peneplains, but also particularities in the geomorphology evolution. The monocline edge retreat in the* Eocene *limestone trough topples, reveals lots of marine fossils on which the Eocene paleoenvironment was defined.*
KEYWORDS: *limestone, Eocene, monocline, paleoenvironment, topples, Prislop, Maramureş*

PERMANENT STATIONS NETWORK REFERENCE GNNS PRIVATE AS AN ALTERNATIVE TO THE NETWORK ROMPOS - ROMANIA

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ABSTRACT: *The network of permanent reference stations in private practice is like an alternative to the national public network ROMPOS and it has accomplished quite a shy development. Lately, in Romania, the number of permanent reference stations is about 70, in the public domain, namely the network ROMPOS and in the private domain there are about 25-35, most of them being the Permanent GPS Reference Stations from the TGRef network administrated by SC TOP GEOCART SRL.*
KEYWORDS: *GPS, ROMPOS, RTK, GNNS*

CONSIDERATIONS CONCERNING THE SETTING-UP OF THE MINING SURVEY IN THE MINING PERIMETER OF SĂSAR AND IN THE MINING AREA OF BAIA MARE TOGETHER WITH STAGES INVOLVED IN THIS SURVEY

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ABSTRACT: *The rich deposit of gold and silver situated in the Mining Perimeter Săsar have determined an early development of the mining activities in the area, as Săsar Mine was one of the most important mining unit in this area, if we are to consider the aspect of the deposits, the territorial length of the properties in the area and last but not least its localization- in the buildable urban of the municipality of Baia Mare. In the context of the mining reorganization that has undertaken our country, several properties from the Săsar Mine patrimony became available or in the near future can become available for a correct and efficient usage of these properties in order to generate benefits. The present work intends to accomplish the mining survey of Săsar Mining Perimeter, as a first but most important step towards the efficient usage of the owned real estates.*
KEYWORDS: *Mining Perimeter, Mining Survey, cadastral plan, cadastral register, cadastral numbering, cadastral delimitation*

ACCESSING INFORMATION IN GRAPHICAL CADASTRAL DATABASES USING VISUAL LISP

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ABSTRACT: *Visual LISP is a programming environment that allows resolving specific issues, including handling data in in the field of graphic cadastral databases. This article presents the way of handling the data components from a grahical database and an application to allow handling blocks of graphic databases.*

KEYWORDS: *graphical cadastral database, Visual LISP*

THE IMPORTANCE OF THE PROJECT MANAGEMENT IN GIS

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ABSTRACT: *The project management is a relatively recent domain, and its importance was increasing because of the major european and international actions, which are made in the context of some projects. The resources used through these projects (especially the financial ones), have a bigger importance in economical growth (for example the projects from the programmes PHARE or SAPARD), and their area of applicability is increasing. A lot of these projects uses spatial data and requires the developping of GIS applications. This paper emphasizes that any GIS project implies an adequate project management. Is important to know the good practices applied in such projects (for example ESRI practices). At FIG level, in the last workshops and conferences, were open sessions about the subject of the project management. There are presented the principal features and phases for the developping of an appropiate project management, starting with the planning operation of the project structure, and finishing with the management of the risks. The main conclusion is the necessity of a good education in the project management, organizing a lot of trainings, to form GIS specialists with managerial skills.*
KEYWORDS: *GIS, project management, cadastre, quality, risks, planning, costs*

STABILITY IN BENDING AND AXIAL COMPRESSION OF MEMBERES WITH DOUBLE SYMMETRIC CROSS SECTION

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ABSTRACT: *This paper presents the stability verification methodology of uniform members with double symmetric cross section subjected to bending and axial compression in accordance with Eurocode 3: Design of steel structures (EN 1993-1-1:2003: General rules and rules for buildings; EN 1993-1-5: 2004: Plated structural elements). The numerical example also detailed in the paper, concerning the buckling verification of a member with a double T symmetric cross section, subjected to monoaxial bending and axial compression is useful to understand the design methodology.*

KEYWORDS: *steel structure, stability in bending and axial compression, double T symmetric cross section*

THE INFLUENCE OF COMPOSITE COLUMN SLENDERNESS ON THE CONFINEMENT EFFECT

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ABSTRACT: *In a composite column consisting of a concrete-filled hollow steel section, the circular steel tube encloses the concrete core; hence, lateral compressive confining stresses on the concrete are induced by the confinement provided by the steel tube. This paper presents the confinement assessment in accordance with Eurocode 4 norm and the working example analyzes the influence of the column relative slenderness on the confinement factor and on the load carrying capacity of a circular composite column subjected to axial compression. Some useful remarks on the design activity of such members are also presented in this paper.*

KEYWORDS: *composite column, confining stress, axial compression*

SIMULATION OF THE SPATIAL THERMAL TRANSFER THROUGH WINDOWS- SPATIAL THERMAL TRANSFER COEFFICIENT CALCULUS

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ABSTRACT: *The paper presents the researches result concerning the behavior of the glazing surfaces for spatial heat transfer and for the risk of appearance of the condense phenomenon on the interior face of the framework, glass and embrasures. The determined heat flows were used for determining the spatial thermal transmission coefficient and also for comparing the coefficient with the values obtained for the same type of window by bi-dimensional method stipulated in the EN ISO 10077-2:2003 norm. The necessity and opportunity for making the calculus program was imposed by the requirement of explaining the differences in behavior of the window in real conditions of exploitation in comparison with the performances of the window presented by the producer, determined in accordance with the EN ISO 10077-2:2003 norm. At the same time the explanation for the appearance of the condense phenomenon on the glass, framework and embrasure surfaces is imposed. The numerical results presented in the paper were obtained with the help of the expert type calculus program "SPATIAL GLAZING" made by the authors, in year 2004, 2008 version. The calculus program was used for simulating the spatial heat transfer phenomenon through windows for the necessary thermal transfer spatial calculus and for the heat loses and for analyze of the risk for the condense phenomenon.*
KEYWORDS: *window, energy losses, mathematical modeling, numerical methods, expert systems*

CONCRETE - FILLED CIRCULAR TUBES CONFINEMENT EFFECT

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ABSTRACT: *Composite columns built-up in the solution of concrete – filled circular steel tubes are mainly compression elements and secondary beam-columns elements. In a composite column consisting of a concrete-filled hollow steel section, the circular steel tube encloses the concrete core; hence, lateral compressive confining stresses on the concrete are induced by the confinement provided by the steel tube. This paper presents briefly the confinement mechanism and the confinement assessment in accordance with Eurocode 4 norm.*

KEYWORDS: *composite columns, circular steel tube, confinement mechanism*

THE ENERGETIC PERFORMANCE OF THE ENVELOPE ELEMENTS OF A BUILDING - THE EXPERT CALCULUS PROGRAMS "AEC" AND "PERFENERG"

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ABSTRACT: *The stipulations of the Directive 2002/91/CE of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings, was transposed in Romanian by the 372/2005 Law . This law stipulates the compulsoriness of making the Energetic Performance Certificate of the building, technical document that testifies this performance for new and existing buildings, with a serviceable surface of over 1000 m^2, or for renovation or modernization works. In current practice the realization duration for the Energy Expertise documentation, for elaborating the Energy Performance Certificate of a building is about 30 days. The automation necessity of those operations appeared in order to reduce the necessary duration for the thermo technical calculus, for making the Energy Expertise documentation, for elaborating the Energy Performance Certificate and for writing the specialty reports. For this purpose our research collective has elaborated calculus programs expert type from which we mention: the calculus program "AEC" specialized on standardized buildings, and the calculus program "PERFENERG" for buildings with various forms in plan and space. These expert type calculus programs include specific modules or programs elaborated by our staff in the last 30 years of activity in the physics-building field.*

KEYWORDS: *Building energy performance, building energy economics, thermal protection, expert systems and numerical methods.*