

CENTRUL UNIVERSITAR NORD DIN BAI A MARE
Facultatea de Inginerie

*NORTH UNIVERSITY CENTRE OF BAI A MARE
Faculty of Engineering*

BULETIN ȘTIINȚIFIC

AL CENTRULUI UNIVERSITAR NORD DIN BAI A MARE

SERIA D

Exploatări Miniere

Prepararea Substanțelor Minerale Utile

Metalurgie Neferoasă

Geologie și Ingineria Mediului

Volumul XXXVI Nr. 2

Indexat ProQuest, EBSCO, ERIH PLUS

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Series D

Mining

Mineral Processing

Non-ferrous Metallurgy

Geology and Environmental Engineering

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1. Papers must be written in English, Microsoft Word and will not exceed 12 pages.
2. Paper includes: title, authors, institution, abstract, keywords, paper content, conclusions and references.
3. Page dimensions A4, top 2cm, down 2cm, left 2,5cm, and right 2cm.
Times New Roman font, single spacing.
4. Paper's title will be written with capital letters 14pts, bold, centered. Authors will be written with 12pts, bold, italic, centered. Affiliation will be written with 12pts, italic, centered. Abstract and keywords with 10pts, italic, justify. After title, affiliation, abstract, keywords leave one line space. Before and after each subtitle leave one line space. Paper text will be written with 12pts, justify, figures/tables included in the text. References will be listed with 10pts.

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MEASURES TO REDUCE THE ENVIRONMENTAL IMPACT OF A SMALL ANDESITE EXPLOITATION (PART II)

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Abstract: *The paper presents the results of 2nd part of an on-going project in which the authors combined their knowledge on environmental protection and recognized expertise as National Agency of Mineral Resources technical experts in planning, implementing and supporting the small extraction quarries fields as a family opportunity to develop their own business. There is a need for multidisciplinary know-how combination (legislation in mining, environmental, surveying domains) to conquer in a proper time and order the well known tortuous roads of exploitation permissions. Also, new graphical and numerical simulations were done combined with surveying works to provide the proper arrangements in the quarry.*

Keyword : *environmental impact, small quarry, andesite, modelling, Rhinoceros 3D*

DETECTION OF INCLUSIONS IN THE CASTING OF HIGH STRENGTH ALUMINUM ALLOYS

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Abstract: *Inclusions are the main cause for a series of critical surface and internal defects regarding the quality of cast products. Damage prediction requires knowledge of the number, size distribution, composition and morphology of inclusions that originate upstream and before the casting process. Inclusions in aluminum alloys are usually non-metallic phases and include oxides, chlorides, carbides, borides, fragment of refractory materials (e.g. silicon carbide) and slag. In aluminum alloys, the most common type of inclusion is aluminum oxide. Industrially, the LiMCA technique is the most applied, which uses an analyzer to in-line determine the impurity degree of the melt, and to detect inclusions in the range of 20-300 μm .*

Keywords: *inclusions, prediction, detection techniques, LiMCA*

RESEARCH REGARDING THE WIRE DRAWING WITHOUT DRAW- PLATE

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Abstract

In this paper I present an unconventional process of plastic deformation, namely the wire drawing without draw-plate. This procedure reduces the wire diameter without using the conventional draw-plate. If the axially loaded wire is heated locally, the neck appears only in this region, and the location of a cooling source, immediately next to the heater, in the direction of reducing the section, prevents further necking and will fix and perpetuate the reduced cross section along its entire length. of wire. By the wire drawing without draw-plate, higher discounts can be obtained per pass than by conventional the wire drawing. Using experimental data and mathematical modeling, the process of plastic deformation can be predicted and described.

Keywords: the wire drawing without draw-plate

STUDIES ON THE PHYSICOCHEMICAL ANALYSIS OF DRINKING WATER SAMPLED FROM A DRILLED WELL LOCATED IN SĂPÂNȚA

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Summary: The paper presents studies conducted to determine some physicochemical parameters of drinking water sampled from a well drilled in Săpânța, Maramureș county, Romania. The pH level is 7.34 at 21. 5°C; the value was determined using the HI98130 Tester Combo device and the hardness was obtained using the Total Hardness Photometer device, the value for the total hardness being 201 mg/L CaCO₃. The amount of iron ions in the analyzed water sample was determined, the result being 0.03 mg/L; phosphate ions, 0.18 mg/L PO₄³⁻; phosphorus, 0.06 mg/L P; phosphorus pentoxide, 0.13 mg/L P₂O₅. The nitrate amount was 0.6 mg/l NO₃⁻N and 2.5 mg/L NO₃⁻, respectively. The devices used in the experiment are purchased from Hanna Instruments and they are part of the Environmental and Material Chemistry laboratory of the Faculty of Engineering of C.U.N.B.M, UT Cluj equipment; the method used is photometric. The concentration of copper and zinc was determined, the values being 0.03 mg/L Cu and 0.17 mg/L Zn; these values are within the C.M:A. limit; the analyzed water sample respects the potability according to the parameters monitored in this study; the town is located at the confluence of the Săpânța and Tisa rivers.

Keywords: water hardness, photometric analysis, drinking water, drilled well, ions, physicochemical analysis.

STUDIES ON THE DETERMINATION OF SI, SiO₂ AND Mo⁶⁺ IN THE DRINKING WATER FROM COLLECTED FROM THE TOWN OF TISA

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Summary: The paper presents studies conducted in order to determine some chemical parameters of the drinking water collected from a well drilled at a depth of 20 m, from the town of Tisa; water being a good solvent, either in the form of precipitation or as a soil solution, it dissolves a variety of chemical compounds with which it comes in contact, as a result, it will contain various chemicals that are responsible for its quality. The results of the analysis were obtained using the HI97735 Total Hardness Photometer, Photometer Mode allows on-demand measurement of a cuvette using the integrated optical system, such as Method selection, Zero, Read and Timers, during the experience it indicated the following values: 0.94 mg/L Si, 2.00 mg/L SiO₂, 2.6 mg/L Mo⁶⁺, 4.0 mg/L MoO₄²⁻ and 5.1 mg/L Na₂MoO₄; these parameters are not mentioned in the legislation, and therefore we do not know the maximum admissible concentration. The direct influence of water on the health of the human population is exerted through its qualities, respectively through its composition, along with the progress made in the methods of chemical analysis of water, other potability criteria such as the presence of mineral salts or existing substances in the water have been defined.

Keywords: Silicon, molybdenum, drinking water, drilled well, ions, chemical analysis, chemical parameters

WORLDS DEMAND ON MINED RESOURCES - STATE OF MINING IN THE WORLD – ROMANIAN CLOSE VIEW

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Abstract : *The development of civilizations was based on mineral resources and will continue to be the main source from which humanity will obtain and use materials and chemical elements from the periodic system (since we have no others) or their combinations in natural or artificial form, necessary in the production of goods , from energy, transport, construction to armaments. Some of those who lead us or can influence the world have introduced the concept that development will be based on something else without concretely defining what it is. This philosophy has caught on very well in the EU, especially in the political world, but not in all countries .*

Keywords : *mineral resources, demand, Mining Data, Romania*

ENVIRONMENTAL EFFECTS OF TRANSPORT AND DISTRIBUTION OF ELECTRICITY EQUIPMENT

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ABSTRACT: The use of electricity by people for various purposes, domestic or industrial is possible by bringing it to new consumers by special electricity equipment, transformer stations, high, medium or low voltage transmission lines.

The effect of these equipments on the environment is due to the Corona discharges in the voltage lines and is materialized in the following aspects, noise pollution, influences of electric and magnetic fields on health, visual pollution.

Among these polluting aspects I chose to deal with determinations regarding:

- the intensity of the noise produced by the installations;
- characteristics of electric and magnetic fields.

The determinations were made in three different locations, namely:

- near two electric transformer stations of 220/110 kV and 110/20 kV;
- near the 20/0.4 kV transformer of PT.

The noise level produced by electrical equipment is between 47 dB and 57 dB depending on the equipment. These values are at the maximum limit with exceedances for PT 19, compared to the noise level stipulated by WHO 536/1997 of 50 dB(A).

Among the characteristics of the electric and magnetic fields, we determined the intensity of the electric field E and the induction of the magnetic field B, values compared with Order 1193/2006, exceedances are recorded for E (V/m) only in the case of LEA 110 kV.

Key words: electromagnetic fields, environmental pollution, human health

CONSIDERATIONS ON HOUSEHOLD HAZARDOUS WASTE (HHW) MANAGEMENT IN MARAMURES COUNTY, ROMANIA

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Abstract

The present study approaches the issue of household hazardous waste (HHW) management in Maramureş County, Romania. The statistical research indicates a share of 0.58% HHW, which means a quantity of 0.87 kg/inhabitant/year. The highest parts are contaminated packaging waste (0.15%), oils and fats with dangerous content (0.082%) and WEEE with 0.08%, and batteries waste and used accumulators (0.050%). The share of hazardous waste in household waste is influenced by several factors, such as: the degree of economic and social development, education, the functionality of the selective collection systems of hazardous waste, etc.

Maramureş County has not implemented yet a selective collection system for hazardous waste from household waste and this leads to an amplification of risks for environmental factors and human health.

Keywords: household hazardous waste (HHW), contamination, risk, waste management

QUALITATIVE ASPECTS OF UNDERGROUND WATER RESOURCES FROM THE CATCHMENT GROUP TREI IZVOARE, GUTIN PASS, MARAMUREȘ COUNTY

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ABSTRACT

The paper presents the monthly value variations of some physical and chemical parameters for the natural underground water resources in the Trei Izvoare catchment group from the Gutin Pass, intended for human consumption. The monitoring period of the qualitative parameters of the studied waters includes the months of April, May, and June 2022; the average monthly values obtained were graphically represented and compared with the legislation in force. The laboratory equipment used for the analysis of these parameters includes: the Hanna Instrument Turbidimeter, the Henna pH ISE EC Multimeter and the Vision Iris HI801 Spectrophotometer.

The average monthly values of the qualitative parameters – pH, turbidity, nitrites, electrical conductivity, nitrates – are within the value limits of the maximum concentrations allowed according to the republished Law 458/2002. The measured values for the Cu parameter slightly exceed the allowed limit of 0.1 mg/Cu/l, being between 0.11-0.14 mg Cu/l. The Mn parameter shows values that exceed the MCA of 0.05 mg/l, i.e., it recorded values between 0.1-0.22 mg/l Mn. For the Fe parameter, the recorded values are between 0.7-1.07 mg Fe/l, which exceed the MCA of 0.02 mg Fe/l.

The higher values of Cu, Fe, Mn ions in the underground water source can be explained by the geological peculiarities of the Gutâi Mountains, where the water source runs through the existing mineralization and can carry and displace a series of chemical elements, which constitute the geochemical background level of the body of water. It is recommended to apply effective policies in order to reduce the effects of the global phenomenon of drought and an effective management of the use of natural water resources in different industrial and economic sectors.

Key words: underground water resources, qualitative parameters, monitoring

EXPERIMENTAL INVESTIGATION ON THE DIFFERENT MATERIALS ON A PELLETIZING DISC

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Abstract: *The pelletizing operation consists in rolling the material until spheres are formed, during which the fine moistened particles adhere (forming successive adherent layers) by sticking the granules due to the film of water, whose surface tension ensures adhesion. Small spheres with a diameter of 10 - 15 mm are formed (raw pellets) which, finally, are hardened (hardened pellets) at temperatures of approx. 1200-1300 °C. By pelletization we can produce globules (pellets) from the fine-grained concentrate in a wet state when processed in rotary machines. The coalescence of very fine particles occurs due to the action of adhesion forces, amplified by the collision of rolling particles. In the pelletizing process, the granulation of the material plays an essential role; the optimal granulation is below 0.1-0.2 mm (65-80 % material < 0.074 mm), reaching 1-3 mm if the material above 0.2 mm does not exceed 10 – 15 %.*

Keywords: *pelletization, instalation, durification.*

ASPECTS OF TECHNICAL QUALITY CONDITIONS FOR ROCKS USED IN ROAD AND RAILWAY CONSTRUCTION

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Abstract: The work includes considerations regarding the history of the regulation of the regulation of the technical quality conditions of rocks in road works, bridges, railways, civil and industrial constructions, etc. The specifics of the regulations in Romania were analyzed through the conditions imposed in the old regulations called STAS, which were modified in the SR (Romanian Standard). These regulations were the basis for the identification of useful rock reserves and their classification. After entering the European Community, Romania took over the European norms that have the same principles regarding quality but have different determination methods, adapted to the new particularities of the relationship between the producer and the beneficiary of mining products. Also, the work indicates that these criteria were not always respected, a fact that generated works with numerous non-conformities.

Keywords: technical conditions, rock quality, construction works, regulations



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