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Faculty of Engineering

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Exploatări Miniere

Prepararea Substanţelor Minerale Utile

Metalurgie Neferoasă

Geologie şi Ingineria Mediului

Volumul XXXVII Nr. 1

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STUDY OF THE GEOLOGICAL-TECHNICAL CONDITIONS OF THE ROSIA POIENI COPPER ORE DEPOZIT

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***Abstract**: The main geological-technical conditions of the porphyry copper ore deposit from Rosia Poieni, namely: geological data, structure, tectonics, mineralogical composition, degree of hydrothermal alteration, meteorological factors, hydrogeological and hydrological characteristics and technical-mining conditions are presented. The comparative study of the physical-mechanical and mineralogical-petrographical characteristics of the rocks that make up the deposit, as well as the behavior of the rocks during the drilling-blasting operations, made it possible to divide the rocks and draw up a map with the zoning of the open pit, depending on the physical-mechanical properties. The zoning of the deposit according to the physical-mechanical properties allows to decide on the suitable mining works for the opening, preparation and exploitation of the deposit, in the future. In addition, important information for the planning of excavation equipment, as well as for establishing a rational consumption of explosives can be obtained.*

***Keywords**: Rosia Poieni, geological data, planning, Goldeneye*

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SUSCEPTIBILITY TO CORROSION OF ALLOY 7175 USED IN AEROSPACE

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Abstract: *The purpose of this paper is to highlight the evolution and corrosion damage that can occur in alloy 7175 after exposure to an aggressive corrosion solution. Susceptibility of 7xxx series aluminum alloys to exfoliation corrosion can be evaluated by the corrosion exposure test known as the EXCO test, which consists of accelerated exposure in a chloride solution and comparison of the corroded surface with standard micrographs.*

Keywords: *aluminum alloys 7xxx series, EXCO test, exfoliation corrosion, alloy 7175-T79*

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TRANSFER OF HEAVY METALS FROM DIFFERENT SOILS IN SUNFLOWER PLANTS, STUTTGARTER ONION PLANTS, UNIVERSAL LAWN PLANTS AND LETTUCE PLANTS

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Abstract

The paper presents the laboratory results regarding the monitoring of germination, growth and development of four types of plants (onion, lawn, lettuce and sunflower) grown on two types of agrochemical soils, fertile agrochemical soil (P1) and soil treated with sludge from the station domestic water treatment (P2). Note the lettuce plants grown in sample P1 with a 50% increase compared to sample P2.

In the laboratory research, was followed the relationship between the soil-plant-metal system, the concentration of heavy metals in the soil (Cu, Pb, Zn) and their transfer to the studied plants. Thus, lawn plants stand out with a high content of metals that increases in the following order: Cd, Cu and Zn.

The highest values of the transfer factor in turf plants for Cu 2.42, for Zn 1.75 and 3.35 for Cd are recorded in sample (P2). All studied plants have a non-negligible capacity to bioaccumulate Cd, and in plants that can be used for human consumption (onion and lettuce) the Cd concentration exceeds dozens of times (minimum 29-maximum 54.9 times) the maximum limit allowed in vegetables, and they are not recommended for food consumption.

The sensitive use of the studied lands (agricultural lands) and the values of the concentrations of metals in the studied soils, required the comparison of the values of the concentrations of heavy metals in the studied soils with the maximum allowed limits corresponding to the alert or intervention thresholds, indicated in the national legislative provisions regarding the concentration of heavy metals Cu, Pb and Zn. For both soil types, the concentration of Zn exceeds the alert threshold (300 mg/kg dry mass), and for Cd the intervention threshold is exceeded (5.0 mg/kg dry mass).

Key words: heavy metal content, transfer factor, soil threshold value

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STUDIES ON THE ANALYSIS OF ANIONIC SURFACTANTS

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Summary: *The paper presents studies that were conducted to determine the anionic surfactants from a specific surfactant solution, respectively a slightly abrasive cream labeled ecologically, with various uses,and from the drinking water in the public supply network in the city of Baia Mare, Maramureș county, Romania. The values obtained experimentally for the anionic surfactants in the solution and in the analyzed water sample are: 1.7 mg/L, respectively 2.09 mg/L; the presence of anionic surfactants in the environment lowers its surface tension; good solubility, efficiency and relatively low cost present an advantage for this type of surfactants, but they are the most aggressive in relation to the human body. The method used is photometric, the HI97769 Anionic Surfactants Photometer purchased from Hanna Instruments was used in the experiment, this being an advanced portable photo-colorimeter used to measure anionic surfactants in water.*

Keywords: *Anionic surfactants, photometric analysis, drinking water, solution*

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A CRITICAL REVIEW OF POLICY AND MANAGEMENT OF CONSTRUCTION AND DEMOLITION WASTE (CDW) IN MARAMURES COUNTY, ROMANIA

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Abstract

The management of construction and demolition waste in Europe is affected by a lot of limitations, and shortcomings related to the lack of harmonization of the policy, regulation, codes, reporting framework, and action strategies. Romania is one of the countries that have some dysfunctionality in the specific regulation, collection, and reporting of data regarding construction and demolition waste due to the lack of specific legislative or normative documents and insufficient reporting by waste generators and operators authorized to collect this waste. Maramures County is also in this situation. Not having a strategy, normative or legislative acts that guide the direction of action and the traceability of construction and demolition waste, the county database contains many gaps and inaccuracies. This affects the national and implicitly the European statistics.

Keywords construction and demolition waste (CDW), policy, management

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THE PRESENCE OF METALLIC IONS IN THE WATER RESOURCES OF MARA VILLAGE, MARAMUREȘ COUNTY

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ABSTRACT

The paper presents the results of laboratory analyzes for four metallic qualitative parameters (copper, zinc, iron and manganese) from two water sources, Izvorul Fântânile Reci and Pârâul Valea Mare, from Mara village, Maramureș county. The supervision period was 6 months (January 2023-May 2023).

The laboratory analyzes were carried out in the Environmental Factors Analysis Laboratory, Faculty of Engineering, CUNBM, using the supplied Iris Vision HI801 spectrophotometer.

Currently, the water from the Izvorul Fântânile Reci source is used for human consumption, and the water from the Streaml Valea Mare source for domestic activities, irrigation and various livestock activities.

The average monthly values obtained were graphically represented and compared with the legislation regarding the quality standards that a water must meet in order to be potable, but also with the legislation regarding the quality of drinking water. The two water sources by the obtained values of Cu and Zn parameter concentrations for the analyzed period successfully fall into the A1 quality state.

The higher values of Fe and Mn ion concentrations in the Valea Mare Stream water source can be explained by the geological peculiarities of the Gutâi Mountains, where it originates.

Key words: water sources, metal ions

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DIGITAL ENVIRONMENTALLY SPECIFIC NEEDS OF A SMALL OPEN PIT EXPLOITATION IN A PROTECTED AREA (PART I)

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Abstract: Using several intersections extracted from Copernicus of European Union's Copernicus Land Monitoring Service information, and also the provided GIS Protected Area shapes of the Romanian Ministry of Environment **Error! Reference source not found.**, an open pit/quarry project is analyzed concerning the Protected Area Measurements in order to minimize the environmental impact and the investments costs. An ArcGIS Pro License of the Technical University of Cluj Napoca, North University Center of Baia Mare owned in the Faculty of Engineering was used combined with the Commercial License of Rhinoceros 3D.

Keywords: Exploitation, Protected Area, ArcGIS Pro, Rhinoceros 3D

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A CRITICAL REVIEW OF THE TEXTILE WASTE MANAGEMENT IN MARAMUREȘ COUNTY, ROMANIA

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Abstract

The present study represents a critical analysis of textile waste management in Maramureș County. This category of waste poses a threat to the environment if not managed properly. The statistical data on the generation of textile waste in Maramureș County indicate for the period 2017-2021 an increase in the amount of textile waste in municipal waste with the largest amount of 796 tonnes in 2020. This requires a series of measures and techniques for efficient and sustainable management. Currently, there is no selective collection of textile waste from the population, although a separate collection infrastructure is imperatively necessary in the context of the approaching obligation of such a collection starting on January 1, 2025. The statistical data and those from the SWOT analysis, as well as the information from environmental reports or those provided by the authorities, indicate that in Maramureș County a linear economy of textiles is practiced and the collected textile waste is mixed with residual municipal waste. Implicitly, the textile waste is not recicled but it is disposed of by storage posing a high pressure on environmental factors. Therefore, there is an utter need to design and implement a management model in full accordance with the concept of circular economy and sustainability.

Keywords waste, textile, circular economy, management, business model

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RESEARCHERS REGARDING THE ESTABLISHMENT OF TECHNOLOGICAL CONSTRUCTION CALCULATIONS FOR WIRE DRAWING

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Abstract

In this paper I presented some technological construction calculations for wire drawing. These include, first of all, the determination of the reduction in the surface of the cross-section when passing through the draw-plate, the elongation coefficient and the degree of logarithmic deformation. There is a mathematical relationship, in a wire drawing process, between the individual reduction values on each pass and the total reduction. For a more realistic assessment and measurement of wire drawing deformation, the degree of deformation is logarithmically effective (real or true) and total.

Understanding the scientific support on which the wire drawing process is based, we have the opportunity to evaluate the potential of the wire drawing process, but also the aspects of technological construction.

Keywords: the wire drawing, technological construction, draw-plate

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STUDIES ON THE DETERMINATION OF CHLORINE DIOXIDE, FREE CHLORINE AND TOTAL CHLORINE IN DRINKING WATER

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Summary: *The paper presents studies conducted for the determination of chlorine dioxide, free chlorine and total chlorine in drinking water collected from the public water network in Baia Mare, Maramureș county, Romania. The method used is photometric, the device used in the experiment is a photocolorimeter for boilers and cooling towers purchased from Hanna Instruments. Chlorine dioxide content was determined using the Chlorine Dioxide method and four types of reagents: Chlorine Dioxide Reagent A, B, C, D; the result of the determination being 0.05 mg/L. Free chlorine was determined with the Chlorine (Free) method, the instrument displayed the result 0.13 mg/L Cl_2; chlorine being a poison for microorganisms, it is used, in small concentrations, as a disinfectant for drinking water. The total chlorine in the analyzed water sample had a value of 0.20 mg/L Cl_2, it was determined with the Chlorine (Total) method, the reagent used in the experiment for this method was a powder Code HI93711-0.*

Keywords: *Photometric analysis, drinking water, free chlorine, chlorine dioxide, total chlorine*

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