

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 XXXVII Nr. 2

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Mining

Mineral Processing

Non-ferrous Metallurgy

Geology and Environmental Engineering

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ASPECTS REGARDING MUNICIPAL WASTE INCINERATION

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Abstract: *The purpose of this paper is to show how MSW incineration proceeds in the laboratory. The process describes the work procedure, process parameters and results obtained after MSW incineration. Following the incineration of municipal waste, a very small amount of ash is obtained as a result of the high temperatures developed in the incinerator.*

Keywords: *high temperature, incineration, municipal solid waste.*

”ÎN LUMEA CELOR FĂRĂ CER” - PROJECT DEDICATED TO SAVING THE INTANGIBLE HERITAGE ASSOCIATED WITH THE MINING ACTIVITY FROM THE NORTH-WEST PART OF ROMANIA

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Abstract: *The paper presents the steps and actions taken to design and implement the project “În lumea celor fără cer”, a project dedicated to preserving the collective memory of those who worked in the underground of the former Baia Mare mining region. The project is intended to be a professional effort to save as much as possible of the intangible heritage, represented by the testimonies of various people, who worked in the traditional and emblematic activity of mining in the northwestern part of Romania, in general, and of Baia Mare, in particular.*

Keywords: *mining, intangible heritage, mine flowers, miner, mine, occupational diseases, mining accident.*

STUDIES ON THE DETERMINATION OF Fe, Mn, $KMnO_4$, AND MnO_4^- IN MINERAL WATER (BORCUT-VALEA PEȘTILOR)

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Summary: *This paper presents studies conducted to determine certain chemical parameters of mineral water (borcut) originating from a well in the locality of Vișeu de Sus, Valea Peștilor. The mineral water is pleasant in taste and is housed in a wooden vessel. Experimental determinations were carried out using the Iron Low Range & Manganese Low Range Photometer device and the Photocolorimeter for Boilers and Cooling Towers HI83305. The results obtained from the experiment are as follows: 0.205 mg/L Fe; 49 $\mu\text{g/L}$ Mn; 106 $\mu\text{g/L}$ MnO_4^- ; and 141 $\mu\text{g/L}$ $KMnO_4$. Manganese is one of the widely distributed metals in nature (very rarely in native form), pure manganese is gray, reacts slowly with cold water, and the most important manganese ores are the oxides, with the most important manganese oxide being MnO_2 .*

Keywords: *iron, manganese, mineral water, borcut, ions, chemical analysis, chemical parameters*

SUSTAINABILITY OF THE HYDROMINERAL RESOURCE FROM THE BORCUTULUI VALLEY, BAIJA SPRIE CITY

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ABSTRACT

The paper presents the results obtained in the laboratory regarding the concentrations of the tested quality indicators, necessary to outline an initial assessment of the current state of quality for the hydromineral source in the city of Baia Sprie, Maramureş county.

The equipment used in the laboratory analyzes is represented by: the Hanna instrument laboratory multimeter for the determination of pH, TDS, electrical conductivity, electrical resistivity and salinity values; Hanna Instruments HI 93703 turbidimeter for turbidity determination; spectrophotometer Iris Vision HI801 for the determination of microelements (Ca²⁺, Mg²⁺ and Cl⁻), microelements (Fe²⁺, Zn²⁺, Cu²⁺, Cr²⁺, Mn²⁺), sulfates, nitrates and nitrites, ammonium, Al³⁺, Cr⁶⁺; Binder drying oven for determining the dry fixed residue indicator at a temperature of 180 °C.

According to the obtained results, the hydrothermal source falls into the category of natural mineral waters with acid pH (pH<6.103), which presents a rich mineralization (Rs=2775 mg/L), at the same time as being a ferruginous water with a concentration of Fe²⁺=1.43 mg/L, with a high salinity S=5.4%, in which there is a considerable presence of microelements Ca²⁺=130 mg/L, Mg²⁺= 27 mg/L, but also SO₄²⁻=150 mg /L.

The investigations did not signal the presence of the Al³⁺ ion and only in small amounts are nitrate ions (0.65 mg/L), nitrites (NO₂, -N) =0.019 mg/L and the Zn²⁺ ion (0.09 mg/L). The results highlight the presence of Mn²⁺=1.8 mg/L and NH₄⁺=1.79 mg/L in high concentrations that can change the organoleptic characteristics of the water.

Based on the results obtained, recommendations are specified regarding the diversification of the range of indicators that need to be monitored over a longer period, the purpose of which is to establish as accurately as possible the quality status of this hydromineral water source and to be able to propose recommendations regarding its sustainability over time, by establishing the doses and frequencies of human consumption.

KEY WORDS: hydromineral sources, sustainability, water mineralization, carbonated waters

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

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Abstract: This paper is Part II of specific digital need of a small open pit exploitation. 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 **Fehler! Verweisquelle konnte nicht gefunden werden.**, 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

THE LINK BETWEEN FATIGUE RESISTANCE AND TENSILE STRENGTH, ANALYZED ON A COPPER SPECIMEN

ELENA ANGELA POP

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Abstract: *The paper presents a theoretical and experimental study on the connection between fatigue resistance and tensile strength for a copper specimen. We determined the tensile strength of the copper specimen and showed that fatigue resistance depends on it. The results obtained both practically and by simulation are necessary in plastic deformation processes. In order to confirm the link between fatigue resistance and tensile strength, it is necessary to carry out such practical experiments as well as simulations and modeling with the help of computer technology.*

Keywords: fatigue resistance, tensile strength, copper

STUDIES ON THE DETERMINATION OF PHYSICOCHEMICAL PARAMETERS IN MINERAL WATER (BORCUT – VALEA PEȘTILOR) (I)

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Abstract: The paper presents studies conducted to determine physicochemical parameters such as Cr, Ni, Mo, Cu, Zn, Ca^{2+} , Mg^{2+} , Br_2 , P, $CaCO_3$, pH, Ec, TDS in mineral water (borcut) from Vișeu de Sus, Valea Peștilor. The experimental determinations were carried out using the Nikel Low Range Photometer, the Photometer for Boilers and Cooling Towers HI83305, as well as specific photometers for the proposed determinations within the study. The obtained results are: 4 $\mu\text{g/L}$ Cr^{6+} ; 10 $\mu\text{g/L}$ CrO_4^{2-} and 9 $\mu\text{g/L}$ $Cr_2O_7^{2-}$; 0.327 mg/L Ni, 0.1 mg/L Mo^{6+} , 0.308 mg/L Cu, 1.06 mg/L Zn, 170 mg/L Ca^{2+} , 52 mg/L Mg^{2+} , 0.13 mg/L Br_2 , 0.2 mg/L P, 364 mg/L $CaCO_3$, pH = 7.05 at 21.9°C, EC = 1.99 and TDS = 1 ppt. Groundwaters are more mineralized than surface waters, and the deeper the water layer, the higher the degree of mineralization; the solubility of heavy metals depends on soil acidity, and for ions with the same valence, the retention energy increases with atomic mass.

Keywords: chromium, nickel, copper, zinc, mineral water, borcut, chemical analysis, chemical parameters

STUDIES ON GAS EMISSIONS RESULTING FROM MUNICIPAL WASTE INCINERATION

JOZSEF JUHASZ

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Abstract: *The purpose of this paper is the study of MSW incineration and the analysis of the results of gas emissions obtained from the process. The waste incineration process was monitored for 30 minutes, during which continuous measurements were made of the process parameters and the resulting emissions.*

Keywords: *burning, flue gas emissions, municipal solid waste.*



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