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ANALYSIS OF ARISTOLOCHIA LONGA MEDICINAL PLANT FROM ALGERIA

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Keywords: medicinal plants, trace element, biological effects, INAA

Neutron activation analysis was applied to assess trace element concentrations in Aristolochia Longa, Bereztam is the common name, medicinal plant widely used in traditional medicine in Algeria, Morocco and forbidden in several countries. The Cr, Na, La, K, Br, As, Sb have been quantified by long irradiation time with thermal and epithermal

flux of $3.98 \text{ E13 n / cm}^2 / \text{s}$ and $1.49 \text{ E12 n / cm}^2 / \text{s}$ respectively. This irradiation was performed in the core of NUR Algerian Reactor. Certified reference materials SDM-2TM lake sediment was used for the elemental quantification, the IAEA –V10 Hay Powder and IAEA –SL1 Lake Sediment were analyzed for quality of the analytical results.

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RARE EARTH ELEMENTS CONTENT AND LEACHABILITY IN COAL FLY ASH FROM FIGUEIRA COAL POWER PLANT

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Keywords: REEs, leaching, fly ash, coal

On the last couple of years, Brazilian southeast region has faced a serious drought and hydroelectricity is the main source of power in this country portion. Because of that, coal power plants have been operating in their maximum capacity and have enhanced the production of coal fly ash (CFA) in Brazil. Several studies on its reutilization have been conducted and its chemical characterization is important to point new uses and to improve the existing ones. Recently, CFA has been considered as source of rare earth elements (REEs) and the offspring of this new use of this industrial waste has intensified the number of studies on determination of REEs content and leachability, since dilute acid dissolution has been pointed as a possible alterna-

tive of extraction of these elements from CFA. The aim of this study was to evaluate REEs content in coal fly ash from Figueira Power Plant, located at Paraná State, Brazil. Besides that, CFA were leached with a dilute solution composed of HNO_3 and H_2SO_4 (pH = 4.5) over 168 and 336 days. The REEs content was analysed on ashes before and after leaching by Instrumental Neutron Activation Analysis (INAA) and evaluated by statistical tools, such as analysis of variance (ANOVA) and principal component analysis (PCA). The content obtained for non leached ash was compared with those present in commercial REEs ores, such as monazite and bastnaesite, for future commercial purpose.

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SOIL TRACE ELEMENT STATUS IN AN IMPOUDED VEHICLES SCRAPYARD

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The number of motor vehicles has increased by 118% over the past decade in Brazil, which is transforming urban space regarding mobility, parking and disposal capacity of these

vehicles. Impounded vehicle scrapyards overcrowding has become a challenge in many Brazilian regions. This now is considered a potential risk to soil quality, since vehicles are

usually parked directly on the topsoil. The aim of this study was to evaluate topsoil samples from a scrapyards of impounded vehicles for Potentially Toxic Elements (PTEs), like As, Co, Cr, Cu, Mo, Ni, Pb, and Zn, and rare-earths. The area of study is in Ribeirão Pires, São Paulo, Brazil. For this purpose, forty samples were analysed by Instrumental Neutron Activation Analysis (INAA) and X-Ray Fluorescence Spectrometry (XRF). The obtained values were compared with literature data from Brazil and other regions around the world, as so with recommended values from environmental regulatory agencies. Some soil-geochemical variables [including pH, organic matter (OM), cation exchange capacity (CEC)], and texture (e.g. clay, silt and sand content) were used to interpret the behaviour of the studied elements in the soil. The PTEs contents

ranged as follows: As (<3–15 mg kg⁻¹), Co (2–30 mg kg⁻¹), Cr (7–183 mg kg⁻¹), Cu (3–73 mg kg⁻¹), Mo (<1–6 mg kg⁻¹), Ni (<3–38 mg kg⁻¹), Pb (23–211 mg kg⁻¹) and Zn (18–352 mg kg⁻¹). In some hotspots, PTEs content exceeded continental crust and also international recommended values. The normalization of the rare-earth data by the Post-Archean Average Australian Shale (PAAS) indicated high anomalous values of Ce in some points that may suggest an anthropogenic source, such as vehicle exhaust catalysts (VEC). Total contents of PTEs rank in the following order: Cr>Zn>Pb>Cu>Ni>As>Co>Mo. This is the first study in scrapyards of impounded vehicles in Brazil. The results may be used to monitor soil contamination in these sites and for more effective environmental management.

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NEUTRON AND PHOTON ACTIVATION ANALYSES IN GEOCHEMICAL CHARACTERIZATION OF LIBYAN DESERT GLASS

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Keywords: INAA, IPAA, Libyan Desert Glass, tektite, Kebira Crater

Nine samples of Libyan Desert Glass (LDG) have been analyzed using instrumental neutron activation analysis (INAA) in various analytical modes (short and long time irradiation, epithermal) and photon activation analysis (IPAA). Elemental composition of LDG points to quartz sand as a main component of the parent materials, with admixture of elements implying an aluminosilicate component (clay minerals cementing quartz grains). A depletion of volatile elements (alkalis, Zn, As, Br, Sb, etc.) may reflect their evaporation loss during the impact. Higher Zr contents coupled with elevated contents of heavy rare earth

elements may reflect melting of refractory zircon. LDG has recently been associated with the Kebira Crater on the Libya-Egypt border. The impact area was flooded with sea-water during Cenomanian/Turonian stage and the assumed origin of LDG parent materials – compact sandstone with accessory minerals – in marine environment has been supported also by previous Li isotope investigation. No contamination of LDG by meteoritic material has been evidenced.

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ACTIVATION CROSS-SECTION AND ISOMERIC RATIO STUDIES FOR THE ^{nat}Ag(n,x)^{106g,m,105,104g,m}Ag REACTIONS FOR NEUTRONS WITH AVERAGE ENERGIES FROM 15.11 MeV TO 35.3 MeV

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The neutron induced cross-sections for the ^{nat}Ag(n,x)^{106g,m,105,104g,m}Ag reactions and isomeric cross-section ratios for ^{nat}Ag(n,x)^{106g,m,104g,m}Ag were determined by an activation and off-line γ -spectrometric technique with average energies from 15.11 MeV to 35.3 MeV. The quasi-mono high

energetic neutron beam was produced via the ⁹Be(p,xn) reaction through proton energies of 25 MeV, 35 MeV and 45 MeV at KIRAMS, Seoul. Average weighted neutron energies <En> were used in the measurements to compensate the effect of broad quasi mono energy neutron beam.