



“Gheorghe Asachi” Technical University of Iasi, Romania



MINERALOGY AND GEOCHEMICAL DISTRIBUTION OF HEAVY METALS FOR THE FAGUL CETĂȚII TAILINGS, ROMANIA

Sorin-Ionuț Balaban^{1,2}, Ionuț Mihai Prundeanu^{1*}, Ovidiu Gabriel Iancu¹, Harald G. Dill³

¹ „Alexandru Ioan Cuza” University of Iași, Faculty of Geography and Geology, Department of Geology,
20A Carol I Boulevard, 700505, Iași, Romania

²Department of Earth and Planetary Sciences, Birkbeck, University of London,
Malet Street, London, WC1E 7HX, United Kingdom

³Federal Institute of Geosciences and Natural Resources, Stilleweg no.2, PO Box 510153, D-30631, Hannover, Germany

Abstract

This study was conducted on samples taken from the “Fagul Cetății – Iazul nr. 4” tailings pond in the Eastern Carpathians, Romania and is focused on exploring the way in which heavy metals from sulphide rich material are spatially distributed in relation to the geochemical conditions. For comparison, concentrated ore samples from the same area, genetically linked to the Tulgheș lithogroup were also analysed. The mineralogical and chemical composition of the samples was determined along with the main physico-chemical parameters such as pH and Eh values. The results show that the mineralogical composition of the tailings is dominated mainly by quartz, chamosite and muscovite-illite, while in case of the processed ore, the main minerals are, as expected, pyrite and quartz. Some traces of jarosite, ankerite, muscovite, gypsum, albite as well as microcline were identified and linked to the geochemical conditions at the surface of the tailings, which revealed an heterogenic environment that can be divided into an acid, oxidizing area in the E and N, characterised by high contents of As, Fe, Pb, Sn and Co and a neutral area in the south-western slope of the tailings that revealed higher contents of Mn.

Key words: Eh, heavy metals, mineralogy, pH, tailings

Received: December, 2013; *Revised final:* August, 2014; *Accepted:* August, 2014

* Author to whom all correspondence should be addressed: e-mail: prundeanu.ionut@gmail.com; Phone: +40 0748358783