

TOWARD A MULTIDISCIPLINARY STRATEGY FOR THE CLASSIFICATION AND REUSE OF IRON AND MANGANESE MINING WASTES

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Abstract. Mining and mineral-processing wastes have been giving a lot of concern in recent times. This paper has evaluated an integrated multidisciplinary strategy for mining wastes characterization, their possible recycling and reuse, and critical raw materials recovery. After the *in situ* sampling campaigns, mining wastes have been characterized and the acquired mineralogical, chemical and spectral information have been used to create a map of mining waste deposits by means of the new multispectral satellite Sentinel-2A classification. The use of Fe-Mn rich wastes in arsenic removal and phosphorus recovery from water was discussed. Furthermore, mycorrhizal-assisted phytoextraction of metals from contaminated soils classified as Class 1 to 4 by remote sensing showed a good potential for their possible recovery from biomass, and results indicated that the system was suitable for the uptake of several elements. Results are encouraging and the application of such approach can be important to develop a circular model for sustainable exploitation of mining wastes.

Keywords: mining waste, metal recovery, recycle, remote sensing analysis.

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