

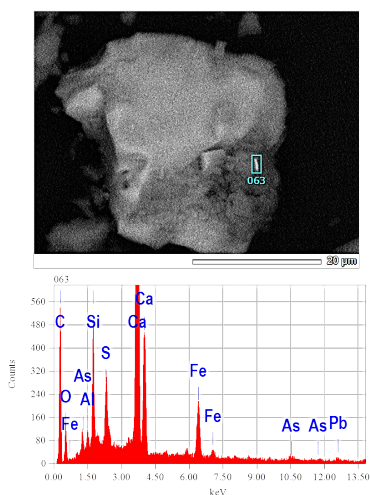
Formation of arsenic secondary minerals and geochemistry dynamics in different mineralogy deposits

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Arsenic toxicity and the related impacts on health are identified as a primary concern in the world. Mining and metallurgical activities are one of the major sources of anthropogenic As [1], especially as a result of Cu and Au tailings. Active methods of arsenic immobilisation involve high input of energy and resources, while natural attenuation methods inputs are low in comparison [2]. However, the mechanisms of secondary minerals formation and the stability of the attenuated forms of arsenic in natural environments are still unclear and only few works have been published on this matter [3]. In this work, arsenic bearing tailings from three distinctive mineralogy groups (Iron-Oxide Copper-Gold, Porphyry copper and skarn-calcite) are weathered under wet and dry cycles on column systems. Analysis is carried out for leachates (pH, electric conductivity, anions, metals) and solid phase (total digestion, XRD, SEM). The SEM results for Skarn-calcite mineralogy strongly suggest the formation of Calcium-Lead arsenates over the pyrite mineralogy, a secondary mineral attenuating form of the metalloid. Relevant oxidation processes in Porphyry copper mineralogy are evident in the sulphate and EC analysis.



[1] Garelick H., Jones H., Dybowska A., 2008. Reviews of Environmental Contamination Toxicology. **197**: 17-61. [2] Parviainen, A. (2009) 28(4), 291-304. doi: 10.1007/s10230-009-0088-2 [3] Martínez-Villegas, N. et al (2013). *Environmental Pollution*, **176**, 114-122.