Textural, geochemical and leaching study of volcanic ash: Environmental impact of the Calbuco volcano eruption, april 2015

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The 23rd of April of 2015, the eruption of Calbuco volcano produced ash falling over certain localities. In San Martín de los Andes (~140 km from the vent), Argentina, two pristine ash samples were collected. The grain-size (Laser Diffractometry) of the particles is well-sorted (main peak at ~110µm diameter) and its fine fraction (<4µm) is significant being up to 5-7%, which represents a respiratory health hazard. The ash is composed by glassy, vesicular shards with smooth-skinned surfaces, and minor mineral fragments. The morphoscopy (SEM-EDS) is mainly blocky but also drop-like and plate-like suggesting hydromagmatism [1]. Certain coated epitaxies on ash are identified as soluble phases. The bulk rock (XRF) major elements data point an andesitic basalt. The trace elements (ICP-MS/OES) show similar trends than in prior studies [2]. 1 gr of ash was stirred in 50 ml of deionised water for 12h to collect a leachate used as a proxy of short-term weathering. The elemental mobility (Fig.1) is given by the relative mass leached (RML%), i.e., quotient of the bulk elemental composition and the leachate elemental composition. As, Cd, Ni, Hg, Pb, Sb content is above the drinking guideline values [3].

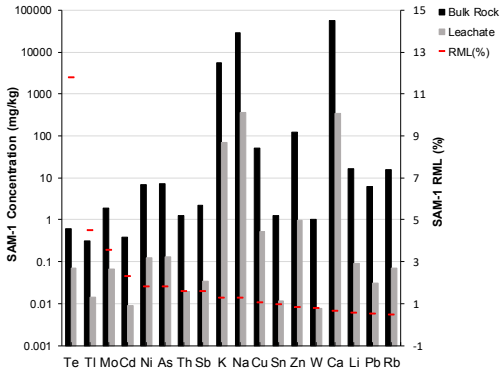

Figure 1: Bar chart diagram of moderate mobile elements (RML 0.5-5%). Mo>Ni>As form sublimate minerals and K>Na>Ca form chlorine and sulphates.

[1] Wohletz & Heiken (1992) Volc. Geoth. Energ, 30-36. [2] López-Escobar *et al.* (1995) Contrib. Mineral. Petrol. **119**, 345-361. [3] WHO (2011) Guid. Drin-wat. Qual. 4th, 1-541.