

Magmatic sulphide saturation in subduction and post-subduction magmas

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Magma fertility in both subduction and post-subduction settings is mainly controlled by an incompatible behaviour of economic chalcophile metals during magmatic evolution as well as their partitioning into an exsolving fluid phase before they become sequestered by magmatic sulphide inclusions (MSI).

The main aim of this project is to understand the role of sulphide saturation in the processes of ore genesis during magmatic evolution in both geodynamic settings above studying MSI: (i) in mineralized and seemingly barren complexes and (ii) in enclaves and their host rock.

The geological areas investigated are; (a) the Quaternary Ecuadorian volcanic arc, hosting, among others, the Llurimagua Cu-Mo and Cascabel Cu-Au Miocene porphyry deposits and (b) the Miocene volcano-plutonic complexes of Konya (hosting the Doganbey Cu-Mo-W porphyry and Inlice Au-epithermal) and Usak (hosting the Kisladag 5.5 Moz Au porphyry), and the Kula Plio-Quaternary volcano, in Western Turkey.

Preliminary results show that, although all studied areas present MSI displaying textural similarities, the Kula volcano rocks (which are the most mafic rocks with OIB signatures and whole rock Cu mean=29 ppm) differ from the rest, presenting MSI hosted mainly by pyroxene (and amphibole) which have maximum Cu content of 32.5 wt% compared to those of Konya (whole rock Cu mean=12.5 ppm) and Ecuador (whole rock Cu mean=27.5 ppm), which are mostly hosted by magnetite and have maximum Cu contents of 73 wt% and 65.7 wt%, respectively.