

Bolivian Crustal Xenoliths: Petrochronological Constraints on the history of the Central Andean Continental Crust

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The growth of Earth's continental crust and the chemical signatures of continental arc andesites imply a crucial petrogenetic link. Erupting through *c.* 80 km of continental crust, the andesitic-dacitic lavas erupted at the Pampa Aullagas and Quillacas monogenetic centers on the Eastern Bolivian Altiplano are host to a petrologically diverse suite of crustal xenoliths. These xenoliths offer a unique opportunity to examine the punctuated history of terrane accretion and arc magmatism along the (Central) Andean margin. This study reports bulk geochemical data (major and trace element), *in-situ* apatite data (trace element, U-Pb chronology), and zircon U-Pb chronology in order to provide new insights on the timescales of crustal accretion and arc crust differentiation beneath the modern-day Bolivian Altiplano.

Apatite REE data from two igneous xenoliths (granodiorites) display variable geochemical characteristics: LREE signatures range from La_N/Sm_N at 0.36-2.6 vs. 1.77-2.71 and HREE depletion Gd_N/Lu_N 3.95-16.18 vs. 2.78-9.57. These signatures are consistent with the derivation of chemically-evolved plutonic lithologies via partial melting of pre-existing sedimentary and igneous sources, respectively. Preliminary U-Pb zircon ages from the igneous xenoliths are Neogene (and younger), interpreted to reflect the most recent period of arc magmatism (<20 Ma) while previously dated zircons in two metamorphic xenoliths (gt-sil granulite; gt granulite) range from the Devonian to the Paleoproterozoic [1]. U-Pb-Hf analyzed on new zircon separates from 16 additional xenoliths will be added to this dataset (e.g. schists, granites, gneiss). Thus, the broad petrochronological nature of these xenoliths suggests multiple crustal domains exist at depth. Ultimately, the bulk geochemical data combined with *in-situ* analyses of accessory phases will help identify periods of crustal recycling and/or juvenile growth throughout the geological evolution of the Central Andean basement.

[1] McLeod et al. (2013), GSA Bulletin 125.