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INITIAL CHARACTERIZATION OF SULFIDES IN CENTRAL ANDEAN ARC HORNBLENDITE CUMULATES VIA SCANNING ELECTRON MICROSCOPY (SEM)

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Sulfur (S) plays an important role during magmatic differentiation as it works to regulate the partitioning of metals into sulfide phases (or vapor) and the redox state of magmas. However, the extent of sulfide fractionation during arc magma differentiation remains uncertain. Previous studies have determined the S budget of arc magmatic systems by analyzing melt inclusions, submarine glasses, or volcanic gas emissions. As these records of S can be affected by crustal processes (e.g., degassing, differentiation), these approaches can underestimate the concentration of dissolved S in primary arc basalts. At continental arcs, magmas are typically transported through a thick crustal column (up to ~75 km in the case of the Central Andes). This has the potential to significantly overprint primary S signatures. To quantify the primary S contents and isotopic composition of near primary arc basalts, this study investigates the petrological, textural, chemical, and S isotopic characteristics of sulfides in mid- to lower- crustal hornblendite cumulates from the Central Andean continental arc. As their bulk-rock Mg# ranges from 67 to 70 (n=7) and crystallization depth is ~50-55 km, the hornblendites are ideal for interrogating early magmatic-crustal processes associated with sulfide fractionation at arcs. A detailed mineralogical and textural characterization of the sulfide phases will first be carried out via scanning electron microscopy (SEM). Initial backscattered electron (BSE) imaging highlights the prevalent distribution of the sulfides throughout the hornblendites, particularly as inclusions in hornblende and titanomagnetite. Sulfides characterized to date range in size from 5 to 40 µm and are of a prismatic, acicular, and euhedral nature. These initial characterizations will serve as the framework for future *in-situ* S isotopic analyses via secondary ion mass spectrometry (SIMS). Collectively, this work will evaluate the extent of the fractionation of sulfide phases at mid- to lower- crustal depths and its influence on the S budget of continental arc magmas.

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