# Geochemical character of less-differenciated volcanism in the Andean Central Volcanic Zone (CVZ), northern Chile

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On the western margin of South America is the active magmatic arc of the Andean Central Volcanic Zone (CVZ), formed on continental crust 70-74 km thick. Rocks of the CVZ are mostly andesitic to dacitic with geochemical values indicating several processes of crustal contamination during magmatic evolution. However, rocks with basaltic to basaltic andesite composition with trace elements and isotopic ratios close to those for primitive magmas have also been recognized [e.g. 1]. The objective of this study is to determine the processes that control the origin and evolution of parental magmas associated with Neogene-Quaternary less-differenciated volcanism of the CVZ.

The majority of evidence of such rare mafic volcanism are located on the active arc between 21°10'–22°50'S in northern Chile, as lava flows and ignimbrites from stratovolcanoes, monogenetic cones and calderas. We present new whole-rock geochemical and isotopic data of such rocks. We recognized basic to intermediate (51.4–59 wt% $SiO_2$) medium-K to high-K calcalkaline to tholeiitic magmas with large ranges in composition (3–6.2 wt% MgO; 4.8–6.1 wt% $K_2O + Na_2O$; 15–379 ppm Cr; 10–79 ppm Ni; 389–884 ppm Sr). The magmatic arc signature is strong and characterized by LILE enrichment relative to HFSE with a negative anomaly in Nb-Ta, positive anomaly in K, Pb and Sr, with low Sr/Y = 19–44 and flat REE patterns [$(La/Yb)_N$ = 6.8–18.2]. $^{87}Sr/^{86}Sr$ ratios are relatively low (0.706–0.707), whilst $^{143}Nd/^{144}Nd$ ratios are relatively high (0.5123–0.5124) compared to other lavas of the CVZ ($^{87}Sr/^{86}Sr$ = 0.705–0.710; $^{143}Nd/^{144}Nd$ = 0.5121–0.5124). These data suggests the origin of these rocks as an evolved primitive magma derived from the asthenospheric mantle (i.e. BA end-member, [2]).

[1] Davidson *et al.* (1991) *Contributions to Mineralogy and Petrology* **105,** 412-432. [2] Blum-Oeste & Wörner (2016) *Terra Nova* **28(6)**, 434-440.