Geochemistry of Nevado Tres Cruces and Nevado Ojos del Salado volcanic complexes, Central Andes, Chile

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The area of Nevado Tres Cruces and Nevado Ojos del Salado volcanic complexes (NTC and NOS, respectively) is very interesting because corresponds to the southern limit of the Central Andean Volcanic Zone, between the highland region known as "Altiplano" and the "flat-slab" subduction zone. This area is the projection below the continent of the "Copiapo Ridge"(or Easter Hot Line) recognized in the Nazca Plate, and have the highest active volcano on Earth (NOS). In the context of National Geology Plan of SERNAGEOMIN, the geological mapping of this area (actually, in internal edition proccess) involved new field observations together with petrographic geochemical and radiometric data (Ar/Ar and U-Pb). Baker et al. (1987) studied the geochemistry of various volcanic centers in the area, but their results indicated no geochemical differences beetween both volcanic complexes, along with a similar lithology and petrography of their rocks: mainly amphibole-biotite dacites and trachy-dacites with differents proportions (or none) reabsorved quartz.

The whole-rock geochemical signal of the NTC and NOS rocks are typical for a subduction volcanic active arc, subalkaline and calco-alkaline of High-K series (62-71% wt SiO2 and 3.0-3.9% wt K2O), with a pattern of enrichment of LREE to depleted HREE, and negative anomalies of Nd and Eu, evidences of upper crustal contamination and fraccionated cristalization proccesses. Nevertheless, the rock samples of NOS show higher HREE and Na2O values than NTC. The ages and stratigraphic relations indicate that both complexes had an episodic and long synchronic evolution at least in the major part of their eruptive history. The explanations of the small differences can be related to their geographic position, as NOS is located more than 20 km to the east than NTC.

This is a contributions to the National Geology Plan, supported by Subdirection of National Geology of SERNAGEOMIN.