Geochemistry and petrology of Holocene alkaline basalts from the Puyuhuapi volcanic group, Chilean southern Andes: a melt inclusion study.

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Puyuhuapi volcanic group (PVG) is located in the Andean Southern Volcanic Zone (SVZ), and comprises nine minor eruptive centers (MEC) aligned in two groups, separated by 2 Km, both with N40° E trend, following the principal trace of Liquiñe-Ofqui Fault Zone. We have collected samples from four MEC and made thin sections and mounts of handpicked olivine phenocrysts, in order to perform a melt inclusions (MI) study to understand the nature of PVG.

The mineralogy of three of the four MEC is similar, corresponding to an olivine vesicular basalts, while the fourth one shows an amphibole andesite composition.

Olivine-hosted MIs can be divided in two groups: 1) Group I – recrystallized MIs, and 2) Group II – naturally homogenized MIs ± bubble(s). We determined major elements contents in Group II - MI and hosting phenocrysts by EMP. Our results show that olivine hosted MI of the three basaltic MEC have compositions ranging from basanite to basaltic trachy-andesite following an alkaline trend; this signature is rather scarce on rocks of the SVZ. Also note that Mg number of the MIs range from 30 to 50 while the olivine composition has no major variation on forsterite percentage (82 ± 2%).

Plagioclase-hosted naturally homogenized MIs of the andesitic MEC show rhyolitic composition and very low values of CaO and MgO, probably there has been crystallization on the wall of the inclusion.

Major elements systematic show a trend of mainly fractional crystallization, being crustal contamination a process rather negligible.