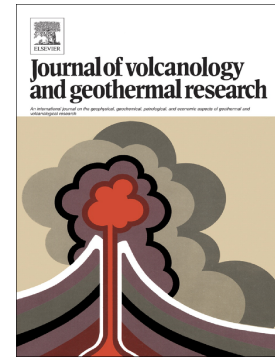


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**Application and reliability of calcic amphibole thermobarometry as inferred  
from calc-alkaline products of active geothermal areas in the Andes**

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**ABSTRACT**

Igneous thermobarometry may contribute to locate the upper-crust heat source/s representing one of the main factors required to establish the potential of high enthalpy geothermal areas through models of the heat flux. To test this possibility, we applied amphibole thermobarometry to some of the youngest lavas and pyroclastics (andesite to rhyolite) of Apacheta and La Torta (Chile) and Chachimbiro (Ecuador) areas representing medium to high enthalpy geothermal systems located in two different crustal contexts along the Andean active continental margins of South America. We used the robust application of Ridolfi and Renzulli (2012) allowing to estimate the intrinsic physico-chemical parameters with reasonably low uncertainties ( $T \pm 24$  °C,  $P \pm 12\%$ ,  $fO_2 \pm 0.4$  log units) and the composition of the melt in equilibrium with Mg-rich calcic amphibole in a wide range of conditions, up to 1,130 °C and 2.2 GPa. In addition, analyses of the intra-crystalline compositional and textural variations allowed us to propose a method to distinguish between

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