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Amp-TB2: An Updated Model for Calcic

Amphibole Thermobarometry.

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One of the most common applications of amphibole (Amp) is thermobarometry, especially for volcanic-magmatic systems. However, many thermobarometers require the input of melt composition, which is not always available in volcanic products (e.g., partially crystallized melts or devitrified glasses), or show rather high errors for characterizing the depth of magma chambers. A new version of Amp thermobarometry based on the selection of recently published high-quality experimental data is presented. It is valid for Mg-rich calcic amphiboles in magmatic equilibrium with calc-alkaline or alkaline melts across a wide P-T range (up to 2200 MPa and 1130 °C) and presents the advantage of being a single-phase model with relatively low errors ($P \pm 12\%$, $T \pm 22$ °C, $\log f_{O_2} \pm 0.3$, $H_2O_{\text{melt}} \pm 14\%$). A user-friendly spreadsheet (Amp-TB2.xlsx) for calculating the physico-chemical parameters from the composition of natural amphiboles is also presented. It gives warnings whenever the input composition is incorrect and includes diagrams for an easy graphical representation of the results (Fig. 1).

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