

Uncertainties in relative geothermobarometry

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A new technique was presented in 2004 by the author that estimates relative differences in pressure and temperature of rocks, referred to as relative geothermobarometry. This study evaluates the uncertainties of temperature obtained by this technique.

The technique includes simultaneous solution of two fundamental equations that describe equilibrium criterion for a reaction in two rock samples among which P-T condition of one sample is well established and the another is unknown. This technique does not require the enthalpy of the reaction. Uncertainties in estimated temperature derived from those in entropy of the reaction is much smaller than those in conventional thermodynamic calculation. The main source of uncertainties are found in determining the reference condition and in choosing activity models of solid solution. Therefore the relative geothermobarometry enables to estimate P-T conditions as precise as conventional geothermobarometry provided that appropriate activity models for minerals are established.