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Trace-element partitioning between alkali feldspar and peralkalic quartz trachyte to rhyolite magma. Part II: Empirical equations for calculating trace-element partition coefficients of large-ion lithophile, high field-strength, and rare-earth elements

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ABSTRACT

Multivariate linear regression (MLR) analysis has been used to develop equations for predicting alkali feldspar/melt trace-element partition coefficients (*D*-values) for certain large-ion lithophile elements (Rb and Eu), high field-strength elements (Zr and Nb), and rare-earth elements (Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Dy, Er, and Yb) in peralkalic felsic systems. A partitioning equation for Sr based solely on data from Pantelleria is also presented. D_{Rb}, D_{Zr}, and D_{Nb} each can be calculated given whole-rock SiO_2 and agpaitic index [A.I. = mol (Na + K) / Al]; alternatively, D_{Rb} can be calculated given feldspar Or content and agpaitic index. D_{Eu} can be calculated given whole-rock SiO_2. agpaitic index, and whole-rock Na_2O/K_2O. Other D_{REE} can be calculated given whole-rock SiO_2, agpaitic index, and whole-rock CaO. These *D*-values all increase with increasing whole-rock SiO_2 and decreasing agpaitic index. D_{Sr} for samples from Pantelleria increase with increasing feldspar Ab and can be calculated given feldspar Ab content. The equations formulated will help to constrain better the choice of *D*-values used in petrogenetic models of peralkalic systems.