Supplementary Table S1. Partition coefficients used for modeling Rayleigh fractionation.

Element	Quartz	K-feldspar	Plagioclase	Biotite	Monazite
Rb	0.012[a]	1.08[b]	0.091[d]	2.51[d]	-
Sr	0.001*	2.50[b]	4.12[d]	0.08[d]	-
Cs	0.022[a]	0.11[c]	0.047[d]	0.62[e]	-
La	0.014[a]	0.07[c]	0.393[e]	0.61[e]	1504[f]
Ce	0.006[a]	0.02[c]	0.251[e]	0.32[e]	1518[f]

Data sources: a = Nash, W.P., Crecraft, H.R. Partition coefficients for trace elements in silicic magmas. *Geochimica et Cosmochimica Acta* **1986**, 49, 2309-2322.

b = Long, P.E. Experiment determination of partition coefficients for Rb, Sr and Ba between alkali feldspar and silicate liquid. *Geochimica et Cosmochimica Acta* **1978**, 42, 833-846.

c = Stix, J., Gorton, M.P. Variations in trace element partition coefficients in sanidine in the Cerro Toledo Rhyolite, Jemez Mountains, New Mexico: Effects of composition, temperature, and volatiles. *Geochimica et Cosmochimica Acta* **1990**, 54, 2697-2708.

d = Fujimaki, H., Tatsumoto, M., Aoki, K. Partition coefficients of Hf, Zr and REE between phenocrysts and groundmasses. *Journal of Geophysical Research* **1984**, 89, B662-B672.

e = Were, P., Keppler H. Trace element fractionation between biotite, allanite, and granitic melt. *Contributions to Mineralogy and Petrology* **2021**, 176, No. 74.

f = Stepanov, A.S., Hermann, J., Rubatto, D., Rapp, R.P. Experimental study of monazite/melt partitioning with implications for the REE, Th and U geochemistry of crustal rocks. *Chemical Geology* **2012**, 300-301, 200-220.

*assumed.