Supplemental Material

*Unit Conversions*

The following equations were used to convert between geochemical units:

*Weight Fraction (ppm🡪mmol/mol):*

$${Mg}/{Ca}{[mmol}/{mol]}= \frac{{Mg \left[ppm\right]}/{Mg Atomic Weight [g/mol]}}{{Ca \left[ppm\right]}/{Ca Atomic Weight [g/mol]}}×10^{3}$$

If *Ca [ppm]* was not reported, it was estimated using:

$$Ca \left[ppm\right]= \frac{Ca Atomic Weight [g/mol]}{CaCO\_{3} Formula Weight [g/mol]} ) × 10^{6}$$

*Weight Fraction Oxide (wt%🡪mmol/mol):*

$${Mg}/{Ca}{[mmol}/{mol]}= \frac{{(MgO \left[wt\%\right]/MgO Formula Weight [g/mol])}/{Mg Atomic Weight [g/mol]}}{{(CaO \left[wt\%\right]/CaO Formula Weight [g/mol])}/{Ca Atomic Weight [g/mol]}}×10^{3}$$

*Mole Fraction (mol%🡪mmol/mol):*

$${Element}/{Ca}{[mmol}/{mol]}= \frac{Element \left[mol\%\right]}{100-Element [mol\%]}$$

All atomic weights used were taken from *Atomic Weights of the Elements 2013* (Wieser et al., 2013). Results were multiplied by 103 to yield numbers that generally start to the left of the decimal point and result in a unit of “mmol/mol.”

**References**

Wieser, M.E., Holden, N., Coplen, T.B., Böhlke, J.K., Berglund, M., Brand, W.A., De Bièvre, P., Gröning, M., Loss, R.D., Meija, J., Hirata, T., Prohaska, T., Schoenberg, R., O’Connor, G., et al., 2013, Atomic weights of the elements 2011 (IUPAC Technical Report): Pure and Applied Chemistry, v. 85, p. 1047–1078, doi: 10.1351/PAC-REP-13-03-02.