

Diffusive isotope fractionation of Cr in olivine as a function of oxygen fugacity

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Diffusion is an important driver of isotope fractionation, particularly significant at high temperatures where equilibrium diffusive fractionation is impeded by the paucity of experimental data, particularly in minerals. Here we present new results along experimental Cr diffusion profiles previously reported along the *c* (fast) axis, for experiments at 1400 °C on pure proto-enstatite. The experiments cover a wide range of oxygen fugacity, characterized using XANES spectroscopy [1]. Isotope ratios were measured using the WiscSIMS Cameca ims-1280 ion microprobe at the University of Wisconsin-Madison.

An example of a ⁵³Cr/⁵²Cr diffusion profile is shown in Figure 1b, where the dependence of Cr isotope diffusion is shown as a function of concentration and isotope profiles, using a Monte Carlo routine with decreasing oxygen fugacity, exhibiting a linear relationship. This relationship, it is inferred that the mass dependence for ⁵³Cr/⁵²Cr is 0.11(3)). This is consistent with a more strongly correlated relationship [2].

