Using stable chromium isotope measurements of komatiites to unlock chromium's geochemical behaviour in the mantle

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Chromium (Cr) behaves compatibly during mantle melting [1]. Cr is depleted in basalts compared to the mantle and experiments show that Cr preferentially remains in the residue Therefore one might expect to see an inverse correlation between Cr concentration and indices of fertility in mantle peridotites. This is not observed, suggesting Cr enters into melts in the same concentration as the mantle. This raises the question of how the Cr variation in peridotites is created.

One explanation has been that peridotite compositions are dominated by the removal of komatiitic melts [2], which appears consistent with the observation that komatiites have the same Cr concentration as the mantle (2500 ppm). Measuring the stable Cr isotopic compositions for komatiites and peridotites will provide additional information on how Cr is being fractionated during melting. We present high precision measurements of three komatiite suites; Belingwe in Zimbabwe (2.7 Ga), Vetreny in the Baltic Shield (2.4 Ga) and Gorgona a Columbian island in the Pacific (90 Ma). TIMS measurements were obtained using a double spike and reveal that isotopic fractionation is minimal and indistinguishable from the mantle.

[1] Roeders & Reynolds (1991), *J. Petrology* 32*,* 909-934.
[2] Liang and Elthon (1990), *Nature* 343*,* 551-551.