

Reevaluating element mobility during continental weathering

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Element mobility during continental weathering can be quantified by partition coefficients (K_{sw-UCC}) between seawater and the upper continental crust (UCC). Previous estimates are relatively incomplete and fraught with large uncertainties. We here use a depth-integrated and volume-weighted approach to reestimate the average composition of seawater, based on profile data from the Pacific and Atlantic Oceans. Combined with the updated UCC composition [1, 2], new estimates for seawater-UCC partition coefficients were obtained (Fig. 1). Our estimates for Al, Ti, Mn, Ga, Nb, Hf, Ta, W, Au, Hg and Bi are lower by one to four orders of magnitude than previous estimates (3). We also provide, for the first time, the seawater-UCC partition coefficients for Rh, Pd, Te, Os, Ir and Pt. Finally, we report new estimates of mean element oceanic residence time based on our new seawater composition and updated composition of pelagic clays from the literature.

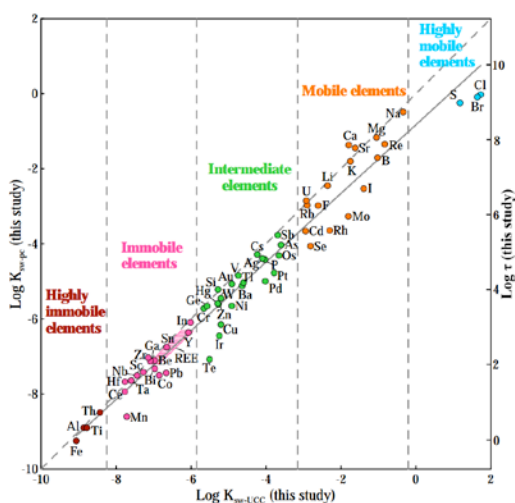


Fig. 1. Relative element mobility during continental weathering. K_{sw-PC} , seawater-pelagic clay partition coefficients. τ , mean element oceanic residence time.

[1] Rudnick & Gao (2003) *Treatise on Geochem.* Vol. 3, pp. 1-64. [2] Hu & Gao (2008) *Chem. Geol.* 253, 205-221. [3] Taylor & McLennan, (1985) *Blackwell Scientific, Oxford.*