

## Earth's Missing Niobium: In the Core?

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As it segregated, the earth's metallic core is believed to have extracted substantial parts of the earth's inventory of moderately 'siderophile' elements such as V, Cr, Mn (1,2) and possibly Si (2) thus causing the observed depletions of the silicate part of the earth in these elements. In contrast, refractory 'lithophile' elements such as Ca, Sc and the rare earth elements (REE) are known to be present in the same proportions in the silicate earth as in the chondritic meteorites considered to represent primitive planetary material (1,3). These lithophile elements did not enter the core. Nb, always treated as lithophile and refractory, is depleted relative to other elements of this type in the crust and upper mantle (4,5), an observation which has been used to infer that there are hidden Nb-rich silicate reservoirs in the deep mantle(5). Here we show that Nb

has similar siderophile behaviour to V and that depletion of Nb in the mantle is most likely due to its having partially dissolved in the segregating core.

- [1] McDonough, WF & Sun, S-s, *Chem. Geol.*, **120**, 223-253, (1995).
- [2] Allègre, CJ, Poirier, J-P, Humler, E & Hofmann, AW, *Earth Planet. Sci. Lett.*, **134**, 515-526, (1995).
- [3] Newsom, HE, *Global Earth Physics. Amer. Geophys. Union ref. Shelf 1*, 159-189, (1995).
- [4] Hofmann, AW, *Earth Planet. Sci. Lett.*, **90**, 297-314, (1988).
- [5] Rudnick, RL, Barth, M, Horn, I, & McDonough, WF, *Science*, **287**, 278-281, (2000).