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Volatile element depletion in planetary materials

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Volatile elements such as Zn, S, In and Cd are depleted in all known inner solar system materials relative to CI chondrites, which approximately represent the composition of the Sun. Volatile element abundances in carbonaceous chondrites are decreasing with increasing volatility down to a 50% condensation temperature (T_c) of 800 [1] or 700 K [2], while less volatile elements are depleted to the same extent relative to CI chondrites. The same hockey stick depletion pattern is observed for lithophile volatile elements in the silicate Earth. Thus, it was concluded that a CI-like component carries the majority of volatile elements with $T_c < \sim 800$ K in carbonaceous chondrites and, by implication, in Earth [3]. To better assess volatile element depletion in achondrites, a new method that employs isotope dilution and chemical separation was set up [4]. First results show highly variable volatile element depletion pattern in eucrites and aubrites.

[1] Lodders (2003) *Astro. J.*, 591, 1220-1247. [2] Wood et al. (2019) *Am. Min.*, 104, 844-856. [3] Braukmüller et al. (2019) *NGeo.*, 12, 564-568. [4] Wang et al. (2014) *GGR*

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