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Constraining the precursor composition of the winonaite parent body using geochemical data.

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Winonaites are primitive achondrites that are related to silicate inclusions in IAB iron meteorites [1]. Bulk element compositions and mineralogy suggest a chondritic precursor [2]. However, the winonaites have oxygen isotopes unlike any known chondrite class [1]. We aim to constrain the composition of the winonaite precursor using the samples Winona, Fortuna, QUE 94535 and Hammadah al Hamra 193. For analytical techniques see [3].

The winonaites show slight depletion in the majority of elements relative to CI when normalised to Yb or Mg. This is more pronounced for volatile elements, indicating a volatile-depleted precursor similar to CM or enstatite chondrites. An association with carbonaceous chondrites is suggested by oxygen isotope data for IAB silicate inclusions and high C contents. The winonaite precursor most likely had a volatile-depleted carbonaceous chondrite-like composition that is not sampled in current meteorite collections.

[1] Clayton, R.N. and Mayeda, T.K. (1996) *Geochim. Cosmochim. Acta*, 60, 1999-2017 [2] Benedix, G.K. et al. (1998) *Geochim. Cosmochim. Acta*, 62, 2535-2553 [3]

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