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**Ti<sup>3+</sup> in hibonite - fingerprint of oxygen fugacity or crystal chemistry?**

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Hibonite, CaAl<sub>12</sub>O<sub>19</sub>, is one of the constituents of Calcium-Aluminum-Rich inclusions (CAIs), the first products of the solar nebula condensation. The oxidation state of Ti in hibonite has been qualitatively correlated with the oxygen fugacity ( $fO_2$ ) in the solar nebula during CAIs formation [1]. In order to better constrain such correlation, as well as to understand the influence of Mg substitution on the oxidation state of Ti at any oxygen fugacity, we have synthesised Ti-Mg-bearing hibonites at different  $fO_2$  using citrate-based sol-gel precursors [2]. EELS and UV/Vis absorption spectra were measured for each run-product and a quantitative estimate of the Ti<sup>3+</sup> content in hibonites was extracted. The results were used to quantify the Ti<sup>3+</sup> present in natural hibonites from different CAIs and show that Ti<sup>3+</sup>/Ti<sup>4+</sup> ratio in hibonite is only partially influenced by the  $fO_2$  prevailing during formation, whereas the crystal chemistry has a predominant effect through local charge balance of the substituting cations.

[1] Ihinger P.D. *et al.* (1986) *EPSL* 78, 67. [2] Cinibulk M. K. (1998) *J. Am. Ceram. Soc.* 81, 3157.

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