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Sample dissolution methods for Hf-W analysis

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Accurate Hf-W isotope analysis require complete dissolution of the sample material. Chondrites however contain variable proportions of refractory, Hf- (and W)-bearing minerals that are difficult to dissolve (e.g. presolar grains, spinel) using the typical digestion method for Hf-W, i.e., HF-HNO₃ (-HClO₄) on a hotplate. High-pressure autoclaves can achieve complete sample dissolution but are avoided because W leaches out of PFA digestion vials [1]. Our experiments with a flux digestion method that uses either a KOH-NaOH or KOH-NaOH-NaF₂ mixture in screw-top Teflon vials failed to entirely dissolve refractory minerals such as e.g., rutile. Newly developed digestion methods using NH₄F [2], NH₄HF₂ [3] or a pressure digestion system (DAB-2, Berhof, Germany) [4] instead of HF-HNO₃ have shown to be potential methods for the complete dissolution of meteorite components, but it may be difficult to achieve low W blanks with the new high pressure digestion. We are currently evaluating the new NH₄F and NH₄HF₂ digestion methods.

[1] Kleine, T. et al. (2002) *Nature* 418, 952–955. [2]Hu, Z. et al. (2013) *Mineral. Mag.*, 77(5) 1335. [3] Zhang,W. et al. (2013) *Mineral. Mag.*, 77(5) 2594. [4]+ Yokoyama, T. et al. (2013) *Mineral. Mag.*, 77(5) 2561. +

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