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Petrographic studies and ^{53}Mn - ^{53}Cr Chronometry of sulfides from EL and EH chondrites

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A high fraction of enstatite chondrites has ^{40}Ar - ^{39}Ar ages close to 4.3-4.6 Ga implying that later collisional events did not severely affect the thermochronological record [1,2]. Hence, short-lived nuclide chronometries potentially enable to decipher the very early history. Manganese bearing sulphides with high Mn/Cr ratios [3] (i.e., alabandite, niningerite, sphalerite, oldhamite) in eight enstatite chondrites were evaluated petrographically. Using the NanoSIMS at MNHN Paris, three different sphalerite grains of the EH3 Sahara 97158 yielded ^{53}Cr excess up to $\delta^{53}\text{Cr}=3500\text{‰}$ and $^{55}\text{Mn}/^{52}\text{Cr}$ up to 160000. A precise isochron defines an initial $^{53}\text{Mn}/^{55}\text{Mn}$ ratio of $(3.14\pm 0.26) \times 10^{-6}$, corresponding to an absolute age of 4562.7 ± 0.5 Ma. No significant difference between individual sphalerites is apparent.

[1] Bogard D. D. et al. (2010) *Meteoritics & Planet. Sci.*, 45, 723–742. [2] Hopp J. et al. 2013. Abstract #1865. 44th Lunar & Planetary Science Conference. [3] Wadhwa M. et al. 1997. *Meteoritics & Planetary Science* 32:281-292.

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