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Relationships between type I and type II chondrules: implications on chondrule formation processes

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Chondrules formed under highly oxidizing conditions relative to the canonical solar nebula, i.e. IW-7 [1] and it is generally inferred that type II chondrules formed in more oxidizing conditions than type I.

In order to check whether this redox difference was established during chondrule formation, or reflected differences in their precursors, we have undertaken a set of experiments aimed at heating type I porphyritic olivine (PO) chondrule proxy under oxidizing conditions. Results show that high temperature isothermal oxidation of type I PO-like assemblages is a very efficient and rapid process to form textures similar to type II PO chondrules.

Implications on chondrule formation processes that can be inferred from these experiments such as possible links between type I and type II chondrules will be discussed.

[1] Grossman, L. et al. (2008) Rev. Mineral. Geochemistry 681 93-140.

Cite abstract as:
Villeneuve, J., Libourel, G., Soulié, C. (2015) Relationships between type I and type II chondrules: implications on chondrule formation processes. Paneth Kolloquium, Nördlingen (Germany), abstract URL: http://www.paneth.eu/PanethKolloquium/2015/0043.pdf (abstract #0043).