

+

#0048

+

Sulfide-magnetite aggregates in Acfer 094 – Clues to nebular metal-gas interactions.

Barth*, M.I.F., Harries, D., Hoppe, P., Langenhorst, F.,
*Institut für Geowissenschaften, Friedrich-Schiller-Universität Jena. moritz.barth@uni-jena.de.

We have sampled polycrystalline (P-type) sulfide-magnetite aggregates in the ungrouped type 3.00 C-chondrite Acfer 094 by FIB-TEM and NanoSIMS. P-type aggregates are often concentric in appearance and consist of pentlandite, troilite, pyrrhotite, magnetite and, in a smaller amount, unusual Fe-Na-phosphates. Small metal grains can be detected in the center of some of the assemblages. The measured Fe/Ni ratios of coexisting metal and pentlandite constrain a formation temperature of ~700-800K, such that a parent body formation of P-type aggregates in Acfer 094 is not likely. The favoured formation model from metal to sulfides and magnetite is set in a nebular environment with changing conditions of oxygen and sulfur fugacities. NanoSIMS measurements of oxygen isotopes in magnetite do not show differences between meteorite matrix and aggregates. Hence, a coupled formation mechanism of P-type aggregates and ^{17/18}O-rich COS [1] can be ruled out.

We acknowledge support by the DFG (HA 7187/1-1, LA830/14-1) and thank Addi Bischoff for sample loan.

+

[1] Seto, Y. et al. (2008) GCA 72, 2723-2734

+

Cite abstract as:

Barth, M.I.F., Harries, D., Hoppe, P., Langenhorst, F. (2015) Sulfide-magnetite aggregates in Acfer 094 ? Clues to nebular metal-gas interactions.. Paneth Kolloquium, Nördlingen (Germany), abstract URL: <http://www.paneth.eu/PanethKolloquium/2015/0048.pdf> (abstract #0048).