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# Chondrule heritage and thermal histories: The tale from trace element and O isotope analyses in Northwest Africa 5958

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Solving the chondrule enigma requires an understanding not only of their thermal histories but also of their links with nebular condensates. We [1] have performed combined LA-ICP-MS trace element and SIMS O isotope analyses on chondrules (mostly type I) and refractory inclusions (mostly AOAs) in the primitive Northwest Africa 5958 C2-ung meteorite, whose components presumably evolved in a closed reservoir [2-4]. Chondrule mesostases sometimes display subdued group II-like REE patterns, indicative of refractory precursors. Yet AOA olivine, with their shallow REE patterns, differs from chondrule olivine, suggesting significant thermal processing of the latter. An anticorrelation of incompatible elements—linked to batch crystallization—with $\Delta^{17}O$—apparently buffered by the chondrule-forming environment—may offer a clue on the physical determinants of their formation duration and, thence, mechanism.

[1] Jacquet E. & Marrocchi Y. (in press), M&PS. [2] Ash R. D. et al. (2011), LPSC XLII, #2325. [3] Bunch T. E. et al. (2011), LPSC XLII, #2343. [4] Jacquet E. et al. (2016), M&PS, 51:851-869.

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