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Constraints on chondrule formation from the newly found CM chondrite

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We studied the elemental composition of matrix, chondrules and the bulk meteorite of Jbilet Winselwan (JW), a recently found CM chondrite with clearly defined Mg-rich chondrules set in a fine grained Fe-rich matrix [1].

The Si/Mg ratio of JW bulk is chondritic (1.18), while chondrules have sub-chondritic ratios (av. 0.90) and matrix has complementary super-chondritic ratios (av. 1.39) of little spread. The bulk JW ratio of the refractory elements Al and Ti is almost chondritic (19.1) and also complementary between matrix (av. 29.6) and chondrules (av. 6.8). The complementary distribution of refractory elements has been observed in other CC [2,3]. Forsteritic olivine and Al-rich phases must have been incorporated in chondrules, while Mg-poor and Ti bearing minerals ended up in the matrix.

A single chemical reservoir from which both components, chondrules and matrix, formed is required to explain CI chondritic element ratios of JW bulk composition.

[1] Russell et al. (2014) *MetSoc* **77** 5377. [2] Palme et al. (2015) *Chemie der Erde* **74**, 507-516. [3]

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Hezel & Palme (2010) *EPSL* **294**:85-93.

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