EVIDENCE FOR Ca-LOSS FROM MESOSTASIS GLASS OF AN ALKALI-RICH CHONDRULE FROM UOC DAR AL GANI 369. A. Pack and H. Palme, Institut für Mineralogie und Geochemie, Zülpicher Strasse 49b, D-50674 Köln

Introduction: Chondrule mesostasis glass is usually enriched in elements that are incompatible with respect to the major chondrule silicates (*ol*, *px*) [1,2,3]. Using EPMA and LA-ICPMS (RSES, ANU Canberra), we have analyzed major, minor and trace element contents of mesostasis glass and forsteritic olivine from a chondrule from UOC Dar al Gani 369 (L/H3).

Results: Chondrule RF02 from DaG369 is a ~700µm large FeO-poor type-I POC with Ca-poor and Na- and K-rich mesostasis. The brownish mesostasis glass appears vitreous in crossed polarized light. Most refractory lithophile elements are enriched in the mesostasis glass by a factor of ~10-15×C1. A notable exception is Ca, which is extremly low in the mesostasis glass (~0.1 wt.%), whereas luminescent forsteritic olivine phenocrysts in chondrule RF02 have CaO contents in the range of 0.4–0.5 wt.%.

The REEs in the mesostasis are uniformly enriched by ~10×C1, but show negative anomalies in Eu, Yb and notably also in Sm.

Discussion: Using Ca-partitioning data by [4], forsteritic olivine with 0.4–0.5 wt.% CaO is in equilibrium with a silicate melt with ~13×C1 CaO. The CaO in the olivine is clear evidence for the presence of CaO in the melt at the time of crystallization of the forsterite. Hence, the chondrule must have lost almost its entire CaO after crystallization of the olivine. The unaltered nature of the glassy mesostasis, however, is indicative for only very limited hydrous alteration of the parent body. We therefore suggest that pre-accretionary alkali-Ca metasomatism [5] may have been responsible for the Ca-loss and the high alkalies in chondrule RF02.

The negative anomalies in Eu and Yb can be explained in terms of incorporation of refractory material (CAI with group-III REE pattern) into the precursor material of chondrule RF02. [6] report chondrule mesostasis glass with a well developed, complementary group-II CAI REE pattern.

The depletion in Sm, however, seems to be unique and we have presently no explanation for the anomalous behavior of this element. At the same day, BCR-2G glass as well as other meteortical components, including two cryptocrystalline chondrules were alanyzed. In these measurements, no anomalous behavior of Sm was observed. Additional measurements will be performed to verify the anomalous behavior of Sm.

References: [1] Jones, R. H. and Layne, G. D. (1997) *Am. Min.* 82, 534–545. [2] Alexander, C. M. O'D. (1994) GCA 58, 3451–3467. [3] Brearley, A. J. and Jones, R. H. (1998) *in* Papike, J. J. (ed.) Planet. Materials, *Rev. in Min.* 36. [4] Libourel (1999), [5] Ikeda, Y. (1982) *Mem. Nat. Inst. Pol. Res.* 25, 34–65. [6] Ash, R. D., McDonough, W. F. and Rumble III, D. (2003) *LPS XXXIV*, Abstract #1907.