Geochemical impact evidence and trace element distribution across the K-Pg event bed, J Anomaly Ridge, Newfoundland

D. LOROCH[1], A. DEUTSCH[2], J. BERNDT[1] AND A. BORNEMANN[3]

[1]Institut für Mineralogie (IfM), Westfälische Wilhelms-Universität Münster (WWU) D-48149 Münster, Germany (*correspondence: d.loroch@wwu.de)
[2]Institut für Planetologie, WWU, D-48149 Münster, Germany
[3]Bundesanstalt für Geowissenschaften und Rohstoffe, D-30655 Hannover, Germany

During IODP Expedition 342 offshore Newfoundland a well preserved K-Pg boundary sequence was recovered in Hole U1403B (core section 28X-1W, 43-57 cm) comprising a ~1.5-cm-thick, graded, green-greyish impact spherule horizon. We analysed this sample using SEM, EMPA, and LA-ICP-MS at the IfM-WWU. The abundances of 50 trace elements were measured in situ along a cross section at 144 235-μm-sized spots to compile a high resolution distribution profile.

We located the Ir-anomaly with a peak concentration of 0.05 μg/g at the basis of the ejecta layer with the altered glass spherules. This high concentration was determined only at an area of just a few hundred μm^2 which is characterized by a change in color from light beige to greenish; this layer is interpreted as the base of K-Pg event bed. Concerning the other PGE, we found also remarkable high concentrations of Pt $\leq$ 2.79 μg/g Pd $\leq$ 1.64 μg/g, Rh $\leq$ 0.348 μg/g, and Au $\leq$ 0.856 μg/g at the bottom of the spherule horizon.This unusual position of the Ir-anomaly below the spherule layer indicates mobilization of PGE, obviously as corollary of the hydratization of the glass in an acidic environment (e.g., [1]) This interpretaion is supported by a strong depletion in REE for Newfoundland which is similar to near total loss of REE in those parts of the black impact glass at Beloc, Haiti, which are altered to smectite [1].

In conclusion, our data for the K-Pg event bed in IOPD Hole U1403B compares well with characteristics in element behavior of other altered distal K-Pg sections [1-5]. The K-Pg sample U1403B, however, provides an exceptional opportunity to document and understand alteration effects of impact glass and the K-Pg bed at the scale of 10s of μm.

[1] Ritter *et al*. (2015) *MAPS* **50**, 418-432. [2] Schulte *et al*. (2010) *Science* **327**, 1214-1218. [3] Smit (1999) *Anuv. Rev. Earth Plan. Sci.* **27**, 75-113. [4] Goderis *et al*. (2013) *GCA* **120**, 417-446. [5] Berndt *et al*. (2011) *Geology* **39**, 279-282.