

THE K-Pg EVENT-BED AT ODP 207 RELOADED: SEARCH FOR THE METEORITIC COMPONENT. A. Deutsch¹, C. Vollmer², R. Tagle³, T. Salge³, B. Hansen³, U. Ott⁴, P. Hoppe⁴, J. Berndt². ¹Institut f. Planetologie, WWU Münster, D-48149 Muenster, Germany. E-mail: deutsca@uni-muenster.de. ²Institut f. Mineralogie, WWU Münster. ³Bruker Nano GmbH, D-12489 Berlin, Germany. ⁴Max-Planck-Institut f. Chemie, D-55128 Mainz, Germany.

Introduction: The 2-cm-thin Chicxulub ejecta bed in the sedimentary sequence drilled at site 1259 on the Demerara Rise during ODP Leg 207 is characterized by a size-sorted sequence of “glass” spherules while shocked quartz and shocked carbonate grains occur only in the upper few mm [1-4]. The spherules display quite complex textures interpreted as pristine despite nearly total replacement of the glass by smectite. LA-ICP-MS profiles across the Cretaceous – Paleogene boundary (K-Pg) with high spatial resolution show that the fall-out of the projectile (~0.1 ppm Pt, measured as proxy for Ir) is concentrated exclusively in the uppermost mm of the ejecta layer [4].

Aim of the project and analytical techniques: In order to locate and separate this “meteoritic” component in the ODP 207 K-Pg layer we have followed two lines of research – (i) acid treatment of the remaining sample according to Berg et al. [5], and (ii) μ XRF analysis of an area of 4 mm² in a thin section across the K-Pg boundary layer with the BRUKER M4 Tornado (50 kV 600 μ A, Al filter).

Results: (i) Refractory metal nuggets of the type isolated from the Murchison CM2 carbonaceous chondrite [5] were not found in the grain separates – probably due to the quite small sample volume. Yet the separate contained aside from rare zircon, several 5-10- μ m-sized SiC grains with terrestrial C- and Si-isotopic compositions (Cameca NanoSIMS 50 at MPI for Chemistry); this data exclude an origin as presolar grains from the K-Pg bolide, identified as CM2 chondrite [6]. In order to clarify whether these SiC grains are a contamination due to drilling and subsequent sample handling or derive from sources in the continental hinterland of the ODP leg (e.g. [7]), we currently investigate the remnants of an acid treated reference sample from the Maastrichtian (ODP 207, site 1259C, 110-116 cm) with the BRUKER QUANTAX EDS system on a computer controlled FE-SEM with stage control. This system combines morphological with chemical classification allowing automated detection and classification of particles sub- μ m in size.

(ii) The XRF map corresponds well with data in [4]: Relative to the upper continental crust, Pb is significantly enriched; moreover, Fe, Ni, and Cr display high concentrations but Ni/Cr is low (LA-ICP-MS data) compared to this ratio in CM2 chondrites.

Outlook: Obviously even texturally pristine K-Pg event deposits in a marine environment reflect primarily changes in the ocean water chemistry at the K-Pg boundary. Successful separation of true impactor remnants (the carrier of the PGE anomaly) would require much larger sample volumes.

References: [1] MacLeod K.G. et al. 2007. *Geological Society of America Bulletin* 119: 101-115 [2] Schulte P. et al. 2009. *Geochimica et Cosmochimica Acta* 73: 1180-1204. [3] Schulte P. et al. 2010. *Science* 327: 1214-1218. [4] Berndt J. et al. 2011. *Geology* 39: 279–282. [5] Berg T. et al. 2009. *Astrophysical Journal* 702: L172-L176. [6] Trinquier A. et al. 2006. *Earth and Planetary Science Letters* 241: 780-788. [7] Shiryayev A.A. et al. 2011. *Lithos* 122: 152-164.