THE NATURE OF ALTERATION CLAYS AND ELEMENT MOBILIZATION IN CHICXULUB YAXCOPOIL-1 DRILL HOLE.

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Introduction: We analyzed samples from the matrix between clasts in the upper portion above the melt sheet in the Yaxcopoil-1 (YAX) drill hole to understand the nature of the alteration and trace element mobilization, and to compare these findings with altered materials from other craters.

Analytical findings: Five samples were characterized using microprobe, SEM, Cameca IMS 4f ion probe, and X-ray diffraction. Our preliminary X-ray analyses and clay compositions are consistent with the presence of smectites in the samples (Dewey Moore, personal comm.). The chemical compositions for these alteration materials range from that of an average montmorillonite composition in the uppermost units (from 800.68m to about 836m), to that of iron and magnesium rich saponite in the lower units (846.7m to 861.72m). With increasing depth, the alteration chemistry produces strong linear trends toward either iron or magnesium (fig. 1). Alteration materials from Mistastin are chemically similar, but do not contain the broad chemical variations as those from Chicxulub, nor do materials from Lonar, which contain well-defined iron-rich saponite and celadonite [1].

Mobile elements in the YAX matrix clays are fractionated with depth. Ba is progressively depleted upward, while Li, Be, and B are enriched upward in the section.

Discussion and Conclusions: The nature of the matrix clays in the Yaxcopoil core above the melt sheet is consistent with hydration of fine-grained material, which could be either glassy dust, or metastable eutectic dehydroxylate (MED) condensates [2] from the impact cloud, as altered YAX compositions produce co-linear trends with a join between two MED end members. Vertical transport of Li, B, and Ba by hydrothermal fluids is also suggested by the trace element data.

References: [1] Hagerty, J. J., and Newsom, H. E. (2003) *Meteoritics and Planet. Sci*., 38, 365-381. [2] Rietmeijer, F. J. M. (2002) *Chem. Erde,* 62, 1-45. We acknowledge the assistance of Dewey Moore with X-ray interpretation and B. Dressler and the Yaxcopoil science team with samples. Partially supported by NASA Partnership Program NAG 5-10143, and P.G. & G. NAG 5-11496.