

FIRST EVIDENCE OF CHICXULUB-IMPACT BOLIDE PROJECTILE AT THE YAXCOPOIL-I DRILL. Ofelia Morton-Bermea¹, Markus Harting², Jaime Urrutia-Fucugauchi¹, Georg Istrate², Pedro Vera¹, Anna Maria Soler¹ and Wolfgang Stinnesbeck³

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Two small pieces of Yaxcopoil-I Chicxulub impact breccia (suevite) (10 mm in diameter) have been analysed by optical microscopy, X-ray diffraction and microprobe analysis (CAMECA 50, at 20 kV). The samples represent loose, rusty, intensely altered material containing small dark nodules (chondrules ?) up to 1 - 2 mm in diameter as well as micronodules of 0.2 - 0.05 mm. The main components are Chlorite-Smectite mixed layer, Saponite, Illite, Glauconite, Calcite as well as Goethite and Hematite, Cl-Apatite, K-Feldspar, Strontio-baryte, Halite, Anhydrite and Gypsum, Jarosite. Other minor components are Plagioclase (48 - 66 % An), Pyroxene, Rutile, Ilmenite, Spinels and other opaque minerals. Graphite, identified by both microprobe and microscopically, is partly subidiomorphic-lamellar or presents infillings. Sporadic micro-cryptocrystalline spheres (50 - 190 μm), with lower birefringence have been identified and likely representing devitrification products of microspherules. Well preserved (fresh) brown-green arcuated glass shards with a refractive index of about 1.524 (\pm 0.002) are occasionally present; they contain small pores but no visible crystals. Fresh brown-green shards are interpreted as microtektites or impact glasses. Microprobe investigations allow insights regarding the nature and origin of different spinels. Homogenous-idiomorph or porous-xenomorph grains of spinels show a large variation of compositions (e.g., with high Fe, Cr, Al, Ti, Mg respectively) and point to different target rocks. A special observation is the occasional presence of unusual Fe-Cr-Ni clusters of tiny blebs containing Au, Ag, Cr, Fe and Cu as well as metallic Cu dispersed within the matrix or associated with spinels. A possible link between these metals and meteoritic material, possibly a carbonaceous chondrite is underlined by high Ir, Pd, Pt, Ru, Rh values. Our analyses, including PGE and Os/Os isotopes, and the metallic Fe-Cr-Ni clusters give evidence that relict material of the bolide appears to be present in the Chicxulub suevite.