**SUB-MICROMETRIC STUDY OF Cu- AND Hg-BEARING OPAQUE ASSEMBLAGES IN UNSHOCKED PRIMITIVE H CHONDRITES: ORIGIN AND FIRST OCCURRENCE OF NATIVE Hg IN A METEORITE.** C. Caillet Komorowski[1], O. Boudouma[2], A. El Goresy[3], M. Miyahara[4] and M. E. Özel[5]. [1]LMCM Muséum National d'Histoire Naturelle - UMR CNRS 7202, Paris 75005, France. E-mail: ccaillet@mnhn.fr. [2]UPMC-ISTEP, Paris, [3]Bayerishes Geoinstitut, Universität Bayreuth, Germany, [4]Institute of Mineralogy, Petrology and Economic Geology, Graduate School of Science, Tohoku University, Sendai, Japan, [5]Cag University, Department of Mathematics and Computer Sciences, Tarsus-Mersin, Turkey.

**Introduction:** We initiated a comparative study of opaque mineral assemblages that contain native Cu to clarify its origin. [1] Demonstrated that the Cu concentration in FeNi metal in Ordinary Chondrites (OC) is too low (0.1 to 0.29 wt%) to exsolve from FeNi. It was demonstrated that there is higher abundance of metallic Cu in H than in L or LL chondrites [2, 3, 4] and that H chondrites show a lower degree of shock-induced features. However, [4] claimed a positive correlation between the intensity of shock and the abundance of native Cu in FeNi metal. Here, we report high abundance of Cu-bearing assemblages in the new unshocked Didim (H3/5) chondrite fell in Turkey in 2007 [5].

**Results:** In Didim, native Cu is associated with Ni-poor kamacite (as low as 2.3 wt% Ni), troilite, taenite and idiomorphic tetrataenite. In Tieschitz (H 3.6), we encounter the same native Cu assemblage as in Didim. Cu is present in opaque assemblages in chondrule-like objects. A delicate texture of tiny HgS and Cu-sulfide surrounds native Cu adjacent to troilite. Nanometer-sized HgS and metallic Hg spherules are intergrown within sulfides and native Cu in a spongy texture next to cinnabar. We also encounter rhythmic layering of HgS alternating with CuS in cube-shaped grains.

**Conclusion:** [6,7] observed Co-rich and Ni-poor kamacite and convincingly concluded that any shock melting of metal phases would have produced a homogeneous FeNiCo alloy. A low T-P breakdown of a metastable Co-Cu-bearing pentlandite was favored to explain this assemblage. No Co was detected in the kamacite in Didim or in Tieschitz. No exsolution of Cu from FeNi is possible, because its content is below saturation. There are no finely spaced twin lamellae //(10-21) or triple junctions in troilite, the latter would evidence recrystallization. No eutectic metal-troilite textures, shock veins or minerals indicating high P, or spherules showing fusion. In Didim, we found idiomorphic troilite without twin lamellae. Troilite fragments in metal next to Cu are single grains depicting no deformation thus refuting the claim of shock being responsible for "exsolution" of native Cu. The unusual assemblages of Hg-, Cu-, Fe-sulfides and Hg in Tieschitz likely indicate equilibration during slow cooling down to low temperatures (<273ºC). This assemblage did not form by exsolution from metal or by a dynamic event. We therefore conclude that metallic Cu in FeNi is unrelated to shock events.

**References:** [1] Clarke R.S. and Jarosewich E. 1978. *Meteoritics* 13:418-420. [2] Ramdohr P. 1963. *J. Geophy. Res.* 68:2011–2036. [3] Ramdohr P. 1973. The Opaque Minerals in Stony Meteorites. *ELSEVIER:* 244. [4] Rubin A. E. 1994. *MAPS* 29:93-98. [5] Caillet-Komorowski C. 2008. *MAPS* 43:1570-1571. [6] El Goresy A. 2006. *MAPS* 41:A204. [7] Chennaoui Aoudjehane H. et al. 2007. *MAPS* 42:A29.