A CABONACEOUS CHONDRITE DOMINATED LITHOLOGY FROM THE HED PARENT; PRA 04401.

J. S. Herrin[1], M. E. Zolensky[2], and D. W. Mittlefehldt[2] and.
[1]ESCG, NASA/Johnson Space Center, Houston, TX, USA.
[2]NASA/Johnson Space Center, Houston, TX, USA. jason.s.herrin@nasa.gov.

The paired howardite breccias Mt. Pratt (PRA) 04401 and PRA 04402 are notable for their high proportion of carbonaceous chondrite clasts [1]. They consist predominantly of coarse (0.1-7 mm) diogenite (orthopyroxene), eucrite (plagioclase + pyroxene), and carbonaceous chondrite clasts set in a finer grained matrix of these same materials. Coarse C-chondrite clasts up to 7 mm are composed mainly of fine-grained phyllosilicates with lesser sulfides and high-mg# anhydrous magnesian silicates. Most of these clasts appear to be texturally consistent with CM2 classification [1] and some contain relict chondrules. The clasts are angular and reaction or alteration textures are not apparent in the surrounding matrix. PRA 04401 contains about 70 modal% C-chondrite clasts while PRA 04402 contains about 7%. Although many howardites are known to contain abundant C-chondrite clasts [2,3,4], PRA 04401 is, to our knowledge, the most chondrite-rich howardite lithology identified to date. Low EPMA totals from CM2-type clasts in other howardites suggest that they frequently contain 10 wt% or more water [2], a figure consistent with their mineralogy. PRA 04401, therefore, demonstrates the potential for hydrous lithologies with >5 wt% water to occur locally within the nominally anhydrous HED parent body. Since the origin of this water is xenogenic, it might therefore be concentrated in portions of the asteroid surface where it would be more readily observable by remote sensing techniques.

We plan to further examine C-chondrite clasts in PRA 04401/2 with the intent of establishing firm chemical classification, estimating water content, and evaluating their relationship with the host breccia. To help place them in context of the HED parent, we will also compare these breccias with other howardites to evaluate which lithologies are likely to be more prevalent on the asteroid surface.

References: [1] McCoy & Reynolds, 2007. Ant. Met. News. [2] Zolensky et al.,1996. MAPS 31:518-537. [3] Gounelle et al., 2003. GCA 67:507-527. [4] Lorenz et al., 2002. LPSC Abs#1570.