SUCCESSFUL CAPTURE, EXTRACTION AND IDENTIFICATION OF HYPERVELOCITY CM2 METEORITE FRAGMENTS SHOT BY LIGHT-GAS GUN . C. Snead, A. J. Westphal, G. Domínguez, *Space Sciences Laboratory, University of California at Berkeley, Berkeley, CA 94720-7450, USA, (westphal@ssl.berkeley.edu)*, M. E. Zolensky, *NASA-JSC, Houston, TX 77058, USA.*

Barrett *et al* [1], including one of us (MEZ), have characterized the effect of hypervelocity capture in aerogel on several minerals (forsterite, calcite, pyrrhotite) common in IDPs. The projectiles were fired at 6.29 km/sec and 7.18 km/sec into aerogel targets of 40 mg/cm^3 and 20 mg/cm^3 respectively. Of the tested minerals, only forsterite grains were captured with minimal alteration, although even these were generally fractured and invaded by melted and compressed aerogel. While some serpentine inclusions in the forsterite survived intact, with 7Å basal spacings still apparent in TEM images, some other inclusions appear to have converted to an intermediate-phase pseudomorph due to dehydration at temperatures between 400°C and 600 °C. Pyrrhotite was either converted to Fe metal, probably due to the volatilization of S, or survived in a fractured state. (Calcite did not appear to survive the acceleration process.)

Here we report the successful capture, extraction and identification of two fragments of a CM2 meteorite (ALH83100) into low-density aerogel. The shot was carried out at the AVGR at NASA-ARC. A mixture of powdered ALH83100 and borosilicate glass microspheres was shot at 4.5-5.0 km/sec into 50 mg cm^{-3} silicate aerogel. The extraction and identification is laborious because of the large background of debris (gunpowder residue, fragments of the gun barrel, etc.) which are visually indistinguishable from the meteoritic particles. We exploited the ferromagnetism of the meteoritic particles to eliminate some of the debris. Our preliminary results indicate that only a few percent of the particles captured in the aerogel are part of the original projectile collection. In Figs. 1 and 2, we show images of the particles; in Figs. 3 and 4 we show their EDX spectra. These particles will be analyzed by TEM to determine the extent of thermal alteration during particle capture.

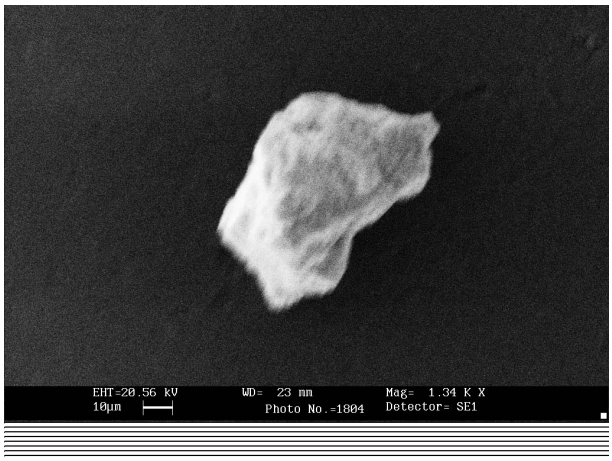

Fig. 1: Image of particle ALH83100-1

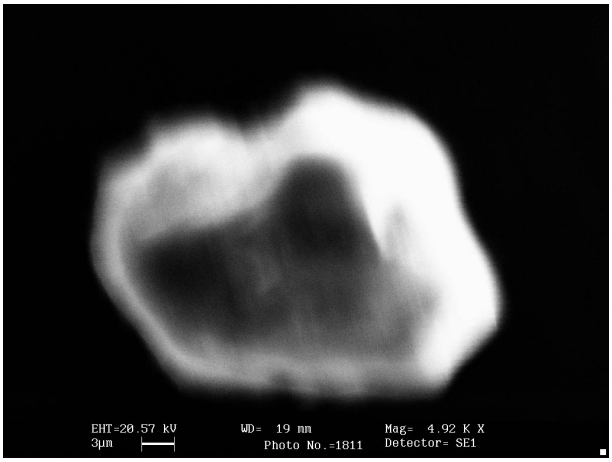

Fig. 2: Image of particle ALH83100-2

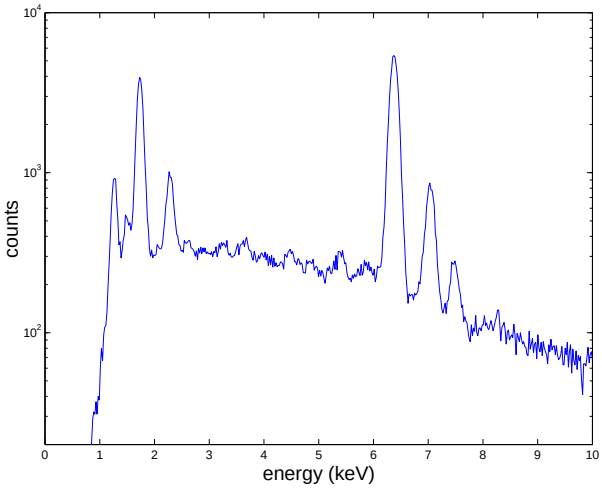

Fig. 3: EDX spectrum of particle ALH83100-1

REFERENCES

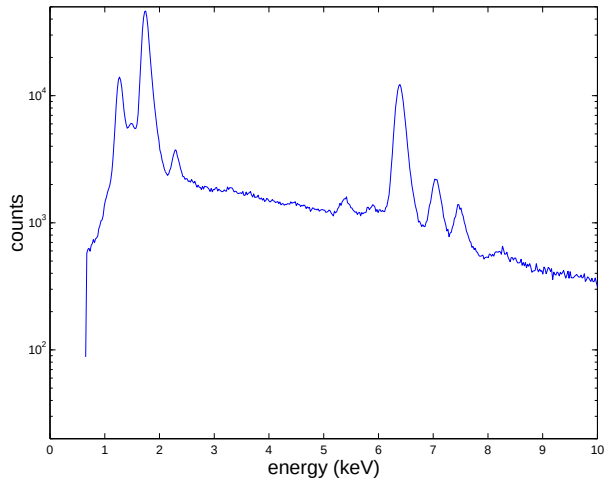

Fig. 4: EDX spectrum of particle ALH83100-2

References

[1] Barrett R. A., Zolensky, M. E., Hörz, F., Lindstrom, D. J., Gibson, E. K. (1992) *Proc. 22nd Lunar and Planetary Science Conference*, 203