VARIATIONS IN POROSITY AMONG MULTIPLE SAMPLES OF A SINGLE METEORITE. M. M. Strait[1] and G. J. Consolmagno, S. J.[2]. [1]Alma College, Alma, MI 48801. E-mail: straitm@alma.edu. [2]Specola Vaticana, V-00120, Vatican City State.

Introduction: Porosity is a fundamental physical property of meteorites that can be used to infer a number of factors in the history of meteorites and their parent bodies. We have been measuring the porosity of meteorites for a number of years by imaging thin sections using backscatter scanning electron microscopy and measuring porosity by counting pixels with a computer measurement [1]. Meteorites are not necessarily homogeneous from one thin section to another [2], and even in hand samples one sometimes sees significant inhomogeneity in porosity among different samples of the same fall [3]. Since a thin section is usually represented by only a few dozen images, any variations in porosity could cause significant variations in the point-counting results depending on where the images were taken across the surface of the thin section. By evaluating the porosity in different thin sections from the same meteorite, we should be able to determine how uniform the porosity is across the sample. This, in turn, can further speak to the nature of the processes that produced the porosity in the first place.

We have chosen a sample to begin evaluating this question that is represented by four thin sections cut from the same hand sample. Buck Mountain Wash is a genomict breccia (H3-5) that contains three chondritic lithologies: a main lithology which is primarily type 5, and two shock blackened lithologies [4]. Two of the thin sections are cut in the main lithology and are facing, parallel samples (BMW-7A and BMW-7B). The other two thin sections represent parts of a longitudinal slice that samples the other two lithologies and the contacts between the three lithologies (BMW-3 and BMW-4). Only the three thin sections with the main lithology present were evaluated for this study.

Results: Approximately 50 images were acquired on each thin section. The average porosity is the same within the error for the three samples of the main lithology: BMW-4 (2.7 $\pm$ 0.5%), BMW-7A (3.0 $\pm$ 0.4%) and BMW-7B (2.9 $\pm$ 0.4%). The three samples also have a similar range in values amongst the images: BMW-4 (1.7-3.8%), BMW-7A (2.5-3.8%) and BMW-7B (2.1-3.8%). The porosity is on the low end of the range exhibited by the typical ordinary chondrite, but the sample is a find and has extensive weathering of the opaque phases.

Similar to the findings in Knyahinya [2], where the thin section was completely imaged and found to have a slight variation (~1%) between one end of the sample and the other, we find that the porosity between different thin sections of the same hand sample is similar, with a variation less than 1% between sections.

This study will be extended to look at thin sections from the same meteorite that are prepared in different labs and from different hand samples. In addition, the variations caused by the shock darkening of the different lithologies in Buck Mountain Wash will also be evaluated.

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