LITHOLOGICALLY-DEPENDENT BULK ISOTOPIC VARIATIONS OF INSOLUBLE ORGANIC MATTER IN THE TAGISH LAKE METEORITE. C. D. K. Herd[1] and C. M. O'D. Alexander[2]. [1]Department of Earth and Atmospheric Sciences, 1-26 Earth Sciences Building, University of Alberta, Edmonton, AB, T6G 2E3, Canada. E-mail: herd@ualberta.ca. [2]Department of Terrestrial Magnetism, Carnegie Institution of Washington, Washington, DC 20015.

Introduction: The Tagish Lake meteorite is an ungrouped carbonaceous chondrite that contains a high amount of organic carbon (up to 2.6 wt%), most of which is insoluble in polar solvents [1]. Lithologically, the Tagish Lake meteorite is anything but homogeneous. Aside from the carbonate-rich and carbonate-poor lithologies described by [2], there exist matrix-rich and matrix-poor lithologies as described by [3]. Results of a NanoSIMS study yielded significant nanoscale variations in H, C and N isotopic compositions [4], consistent with previous studies [5,6] but displaying a difference in the range of isotopic compositions observed depending on lithology. In addition, the complement of soluble organic molecules is lithology-dependent [7]. These observations suggest that Tagish Lake preserves varying degrees of parent-body alteration. We have carried out bulk insoluble organic matter (IOM) isotopic analysis of three samples reflecting the range of lithologies to assess the degree of IOM variation.

Methods and Results: Samples analyzed included 11v (disaggregated material with similarities to the carbonate-poor lithology of [2]), 11i (a matrix-rich lithology [3]) and 5b (a matrix-poor lithology [3]). IOM separates were prepared and analyzed according the methods outlined in [8]. Results are provided below, which includes results from [8] for comparison.

Sample	Previous[8]	11v	11i	5b
C (wt%)	~ 2	1.67	1.86	1.86
H/C (at.)	0.337	0.456	0.527	0.766
δ^{13}C (‰)	-14.2	-13.3	-13.1	-14.5
δ^{15}N (‰)	73	56.1	52.1	57.5
δD (‰)	596	789	1007	1834

Discussion: The largest variations among the samples exist in H/C ratio and deuterium content, reflecting significant variations in the degree of IOM aromaticity. The variation in H/C and δD observed in these IOM samples spans the range from CV meteorites to CIs and CMs, approaching values seen in CRs [8]. The lack of variation in C content argues against low-temperature chemical oxidation [9], perhaps suggesting that Tagish Lake has undergone hydrothermal alteration [e.g., 10] not witnessed on other carbonaceous parent bodies.

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