Light element isotopic composition of Ultra-Carbonaceous Antarctic Micrometeorites (UCAMMs).

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Ultracarbonaceous Antarctic Micrometeorites (UCAMMs) are characterized by a high amount of organic matter (OM) (> 50 vol%) [1, 2] exhibiting extreme deuterium excesses [2] and a high nitrogen concentration [3-5]. These samples most probably originate from a cometary reservoir in the outer solar system. We performed light elements (H, C and N) isotopic analyses on UCAMM fragments using a newly developed high mass resolution (HMR) protocol with the NanoSIMS-50 [6]. The OM exhibits a wide range of hydrogen and nitrogen isotopic compositions [7-9] and, together with XANES and TEM data, it appears that it contains various components with distinct mineral concentrations. We will present a scenario accounting for the measured elemental composition and in which the heterogeneous isotopic compositions observed are inherited from precursors formed by GCR irradiation of N-rich ices at the subsurface of a parent body orbiting at large heliocentric distances [5, 10].

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