

Study of aqueous alterations in carbonaceous meteorite parent body using FTIR spectroscopy. (IOM)

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Fourier Transform Infra-Red (FTIR) spectroscopic analysis of Insoluble Organic Matter (IOM) gives us a full workup about the various functional groups present in them which helps us in understanding the various processes these organic constituents have endured during their journey through the ISM.

In the present study, we analyze the IOM extracted from Mukundpura along with 14 other carbonaceous meteorite samples. The IOM extraction was carried out using Cesium fluoride (density~1.6-1.7g/cc) with pH adjusted around 5-7. The insoluble organic contents were then subjected to FTIR analysis using which the temperatures for aqueous alterations, the functional group abundances and their trends are obtained, which are indicative of the chemistry behind aqueous alterations.

Based on the functional groups, these IOMs are classified into various IR spectral groups. Our results indicate that Mukundpura falls into spectral group B which is said to have been slightly more altered than spectral group A which constitutes of type 1,2 chondrites. Deriving quantitative estimates for functional group abundances for IOM is rather difficult using FTIR and hence relative abundances are determined in order to observe the trends. FTIR data largely complements the results obtained from our study using RAMAN and XANES spectroscopy.