

Using Synchrotron Source FTIR to shed light on High Pressure Organic Chemistry and the Early Earth

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The organic content of the primitive materials from which the Earth formed is increasingly well quantified. The role of high pressures in planetary formation and evolution is well-known. Our understanding of the behavior of these organic molecules under those pressures is developing, especially with the application of in-situ high pressure synchrotron-source FTIR measurements to model systems. This talk concentrates on these experiments, both the techniques developed for measuring and maintaining the pressures during experiments, the challenges of interpreting the resulting data, and the implications for our understanding of the early Earth and potential for origins of life. Specific molecules of interest are polycyclic aromatic hydrocarbons, phenol, formic and acetic acids. The high spatial resolution of synchrotron source FTIR also allows further study of the interactions between these organic molecules and silicates typical of the early Earth, which is not possible in lab-based systems.