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Presentation Abstract

Title **Infrared Spetroscopy of Extraterrestrial Materials**

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Abstract Infrared spectroscopy is diagnostic of the mineralogy and structural properties of nearly all materials, whether terrestrial, planetary, interplanetary, or interstellar. Astronomical observations of extrasolar planetary system debris as well as features in the interstellar medium have revealed some mineralogical signatures, which are generally interpreted in comparison to predictions based on pure minerals. To complement those studies, we are measuring the infrared spectra of a wide range of extraterrestrial materials in the laboratory. The goals are (1) to form a new basis for interpreting extrasolar and interstellar material by comparison to the parent bodies of meteorites rather than pure minerals and (2) to determine the infrared properties of meteorites of as wide a range of types as possible in order to study which parent body properties and histories and physical processes can affect infrared spectra. Attenuated total reflectance (ATR) spectroscopy provides convenient measurement capabilities over the range of wavelengths and signal-to-noise that are directly comparable to the remote telescopic observations, 3-150 microns. The materials for the laboratory study were obtained from the NASA Antarctic Meteorite Curatorial Facility and supplemented by terrestrial crater rocks and tektites from private sources. The mid-infrared diagnostic features of silicate minerals are richly present in most samples. The far-infrared measurements, to date, indicate a dependence of absorbance on the degree of shock history. We will examine this effect with future experiments. If confirmed, the results could have implications for understanding mineralogy of extrasolar and interstellar dust, which is likely to have experienced shocks from hypervelocity collisions.