TITLE: Organic Molecules On the Surfaces of Iapetus and Phoebe

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ABSTRACT BODY:

Abstract (2,250 Maximum Characters): Absorption bands of both aliphatic and aromatic organic molecules are found in the reflectance spectra of Saturn satellites Iapetus, Phoebe, and Hyperion obtained with the Cassini Visible-Infrared Mapping Spectrometer (VIMS)[1,2,3]. The VIMS data do not fully resolve the individual bands of C-H functional groups specific to particular molecules, but instead show absorption envelopes representing blended clusters of the bands of aromatic (~3.28 µm) and aliphatic (~3.4 µm) hydrocarbons known in spectra of interstellar dust[4]. In Cruikshank et al. (2014), we matched components of the unresolved hydrocarbon band envelopes with clusters of bands of a range of functional groups in specific types of organic compounds (e.g., normal and N-substituted polycyclic aromatic hydrocarbons, olefins, cycloalkanes, and molecules with lone-pair interactions of N and O with CH_3^+). In the work reported here, we revisit the spectra of Iapetus and Phoebe using VIMS data processed with improved radiometric and wavelength calibration (denoted RC19). The band envelopes of both aromatic and aliphatic hydrocarbons are now more clearly defined, corroborating the provisional assignment of specific classes of molecules in Cruikshank et al. 2014, but permitting a more reliable quantitative assessment of the relative contributions of those classes, and a revision to the earlier estimate of the ratio of the abundances of aromatic to aliphatic molecules.