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Cassini-Huygens mission : which tholins for simulating Titan's aerosols ?

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The exploration of Titan by the CASSINI-HUYGENS mission includes different spectrometers covering the visible and infrared ranges, which will probe the atmosphere (e.g. CIRS, DISR) and the surface (DISR). The analysis of these spectroscopic data requires the optical constant of analogue materials of Titan's aerosols. Titan's tholins, produced in laboratory from N_2:CH_4 mixtures in cold plasma, are considered as the best analogues available to date. However, large compositional and morphological variations are reported among tholins produced from different experiments, and even within the same experiment. Different attempts have been made in order to better constrain the factors controlling tholin's composition, but no systematic studies have been performed for determining the links between the spectroscopic properties and the chemical composition. This study focuses on the chemical characterization of tholins at the micrometric scale, by using different analytical techniques, and attempts to correlate the chemical information wih the infrared spectral properties.

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