

Influence of Benzene on the Optical Properties of Titan Haze Laboratory Analogs in the Mid-Visible

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The Cassini Ion and Neutral Mass Spectrometer (Waite, Jr., *et al.*, 2007) and the Composite Infrared Spectrometer (Coustenis, A., *et al.*, 2007) have detected benzene in the upper atmosphere and stratosphere of Titan. Photochemical reactions involving benzene in Titan's atmosphere may influence polycyclic aromatic hydrocarbon formation, aerosol formation, and the radiative balance of Titan's atmosphere. We measure the effect of benzene on the optical properties of Titan analog particles in the laboratory. Using cavity ring-down aerosol extinction spectroscopy, we determine the real and imaginary refractive index at 532 nm of particles formed by benzene photolysis and Titan analog particles formed with ppm-levels of benzene. These studies are compared to the previous study by Hasenkopf, *et al.* (2010) of Titan analog particles formed by methane photolysis.

References:

Coustenis, A., *et al.*: "The Composition of Titan's Stratosphere from Cassini/CIRS Mid-Infrared Spectra". *Icarus*, Vol. 189, pp. 35-62, 2007.

Hasenkopf, C. A., *et al.*: "Optical Properties of Titan and Early Earth Haze Laboratory Analogs in the Mid-Visible". *Icarus*, Vol. 207, pp. 903-913, 2010.

Waite, Jr., J. H., *et al.*: "The Process of Tholin Formation in Titan's Upper Atmosphere". *Science*, Vol. 316, pp. 870-875, 2007.