

XUV optical constants of tholins for the study of Titan's atmosphere

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Tholins are laboratory amorphous organics used as analogs of the organic aerosol matter present in the atmosphere of Titan [1], Saturn's largest moon. Tholins are used to understand *in-situ* the physico-chemical properties of Titan's remote aerosols. Tholins are grown as thin films in the PAMPRE capacitively coupled plasma setup (LATMOS, Université de Versailles [2]). Gas mixtures of N₂ and CH₄ at 95:5 ratios feed this plasma and simulate Titan's atmospheric composition [3]. Tholin thin films have been measured over a wide spectral range, including the soft X-ray, vacuum-ultraviolet (VUV), and UV-Visible. X-ray absorption spectroscopy was performed at the SOLEIL synchrotron. To measure their dielectric properties in the VUV, a campaign took place at the VUV beamline of the Metrology Light Source. The UV and Visible range were measured via tabletop ellipsometry. The VUV and UV refractive indices of tholins will be incorporated into radiative transfer models of Titan's atmosphere [4] and will elucidate the role of aerosols in shielding from solar radiation and in the thermal balance of Titan.

References

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