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Outlooks in Earth and Planetary Materials

Prospects for mineralogy on Titan

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Abstract

Saturn's moon Titan has a surface that is dominated by molecular materials, much of which are photochemically produced in the moon's atmosphere. This outlook reviews the potential minerals that would be expected to form on the surface and subsurface of Titan from these molecular solids. We seek to classify them and look toward how the future study of these minerals will enhance our understanding of this planetary body. The classification uses the basis of intermolecular interactions, with the materials grouped into "Molecular solids," "Molecular co-crystals," and "Hydrates" classes alongside speculation on other possible classes of potential Titan minerals.

Keywords: Titan, planetary ice, organic minerals, classification