



Titan's chemical state after Huygens

Sushil K. Atreya (1), H.B. Niemann (2), T.C. Owen (3), and the GCMS Team

(1) Univ. of Michigan, Ann Arbor, MI 48109-2143, USA, (2) Goddard Space Flight Center, Greenbelt, MD, USA (3) Univ. of Hawaii, Honolulu

A multitude low abundance hydrocarbon molecules, including the C-H, C-N-H and C-O-H types, are predicted by photochemical models (e.g. 1 and 2). Most are produced in the upper stratosphere. Others, including certain nitriles, could be formed only in the vicinity of the tropopause by the action of galactic cosmic rays. Some of the molecules are potential prebiotic chemical species that may have been present on early earth. Following downward transport, many molecules condense and form aerosols at or above Titan's cold trap. Others survive in the gas phase, or re-evaporate in the troposphere. In this presentation we will discuss our findings based on preliminary analysis of the Huygens GCMS data, and compare them to predictions in order to gain an insight into the complex processes at work to maintain methane on Titan.

(1) The Current State of Modeling the Photochemistry of Titan's Mutually-Dependent Atmosphere and Ionosphere, E. H. Wilson and S. K. Atreya, *J. Geophys. Res.*, 109, E06002, doi:10.1029/2003JE002181, 2004.

(2) Chemical Sources of Haze Formation in Titan's Atmosphere, E. H. Wilson and S. K. Atreya, *Planet. Space Sci.*, 51, 1017, 2003.