

Catalogue of IR and Raman spectra of gas CH₄ and other molecules' coefficients, organics, minerals and ices

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This science case was developed by the WG3&5 to help solve the problem of lacking laboratory and theoretical data on absorption coefficients of CH₄, H₂O, CO₂, aerosol/tholin material, minerals and ices that would be valuable for the interpretation of observational data (with direct application to Titan and other satellites).

Indeed, the interpretation of space mission data such as the Titan spectra acquired by Huygens/DISR require the precise knowledge of the atmospheric parameters in order to be able to retrieve the surface composition for instance. These databases are not readily available today.

We suggest archiving of the existing data and needs through a catalogue of IR and Raman spectra of atmospheric gases and organics in support of space missions to derive the surface composition of bodies with an atmosphere

As a second step, we should identify the capabilities in this field and assure a communication between experimentalists and modelers on the one hand and observers on the other.

Needed data sets:

July2004-end 2008: Space mission data to complete: Cassini-Huygens data (both images and spectra), Venus Express data, Mars Express data and future missions

1950-2006: Laboratory work on CH₄, H₂O, CO₂, etc (gases important in the atmospheres of Titan, Venus, Mars and exoplanets) and organics (tholins) acquired in the right conditions for these objects (e.g. long pathlengths and low temperature for CH₄ absorption coefficients in Titan), and theoretical calculations producing line lists for these species

IDIS could then include easy links to all available databases from all laboratory involved in such planetary-supportive work from experiments and calculations.