Refining Science Case for Titan Ionospheric Chemistry

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I3/CA Europlanet - EC Contract 001637 - http://europlanet.cesr.fr/

Lab experiments data base

Links to existing data bases

Ex: - spectroscopy data bases
- photoabsorption, photoionisation cross sections
- reaction rate constants

Reactions between neutrals

existing data bases, but incomplete, no uncertainty

Ion-molecule reactions

no data bases, one bibliography difficult to use for planetary scientists

V. Anicich's compilation only available as a pdf file!

Nothing for negative ion-molecule reactions

Lab experiments data base

Example

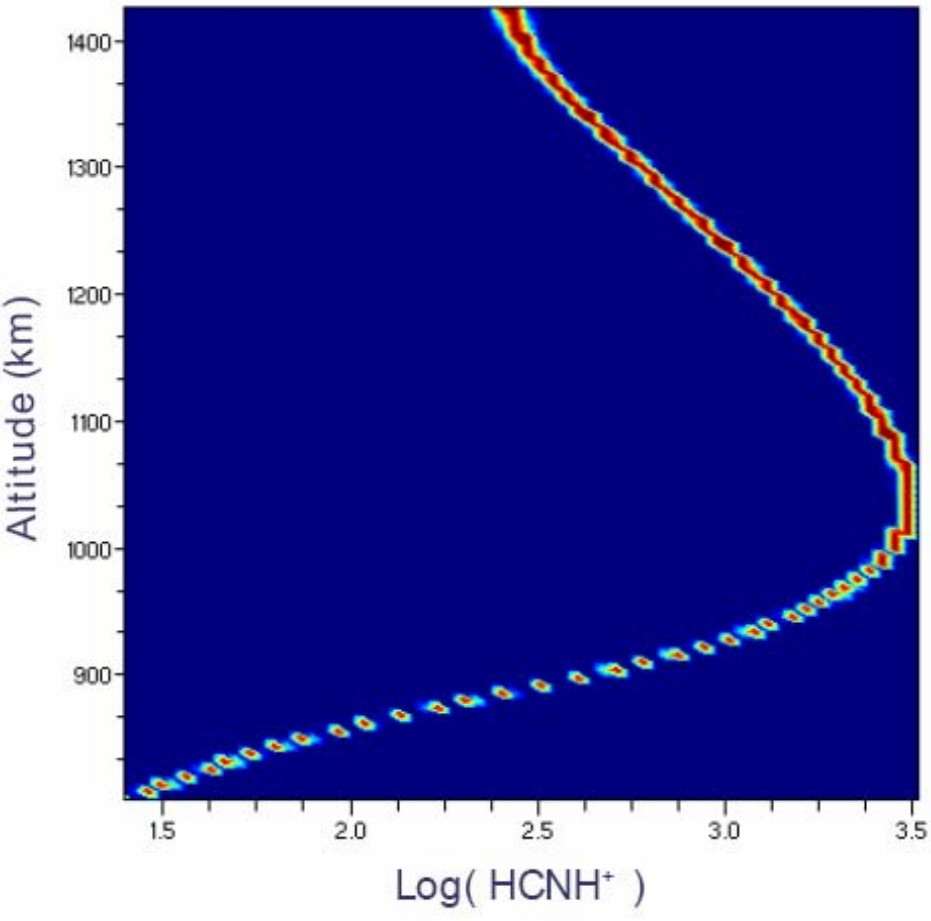
Ion-molecule reactions for Titan's ionospheric chemistry (up to 1000 reactions)

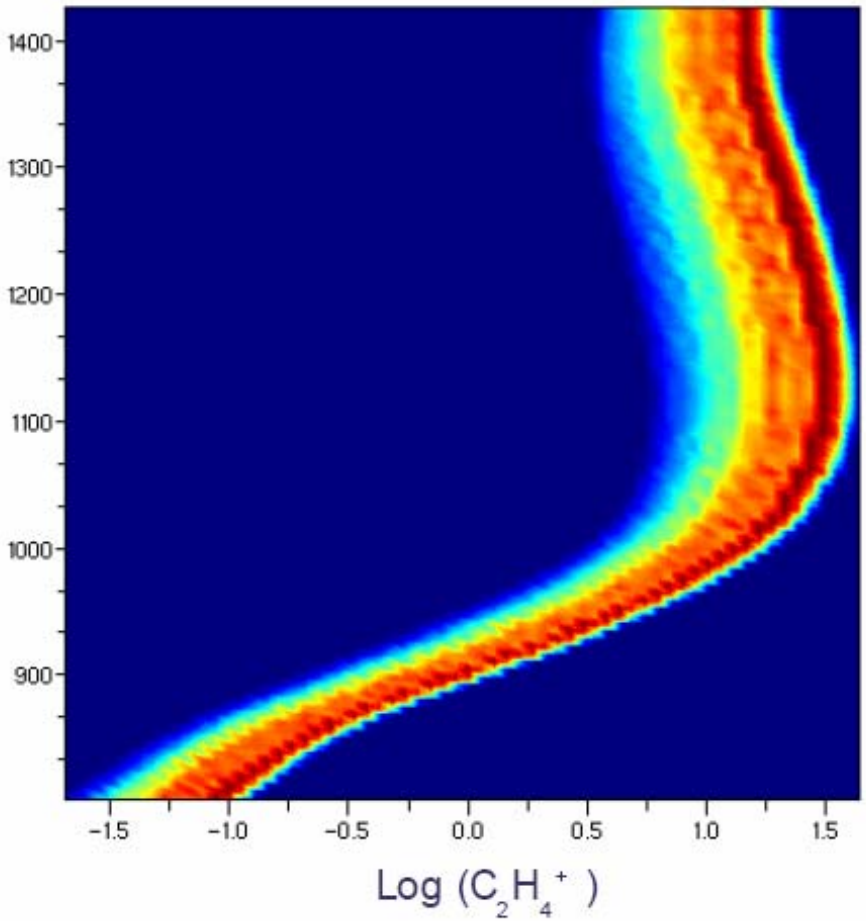
BUT

- no critical evaluation
- most laboratory data obtained at 300K
- uncertainties are almost never given on rate constants and product branching ratios
- lack of laboratory experiments for heavy CxHyNz+ ions observed by INMS (Cassini mass spectrometer)
- almost no laboratory experiments on negative ion reactions

Lab experiments data base

Ion density profiles with uncertainties





Chemistry data base KIDA

Valentine Wakelam (Obs.Bordeaux, France)

- Workshops GRAMIS (CNRS, France) resp. Valentine Wakelam

Steering group for chemistry data bases for the Interstellar Medium

March 13, 2008 — Definition of needs

Nov. 7, 2007 — Data model definition

- ISSI resp. Valentine Wakelam (Obs. Bordeaux, France)

Evaluation of key reactions for astrophysics and planetary sciences (?)

7-10 January, 2008 (next one Dec. 2008)

- ISSI resp. Pascal Pernot (LCP, orsay, France)

Nov. 2008

Intercomparison of models for Titan atmospheric and ionospheric chemistry