

Chemistry, astronomy and physics of H₃⁺

Thursday 9 – Friday 10 February 2012

Organised by Professor Takeshi Oka FRS, Professor Mats Larsson, Professor Steven Miller and Professor Stephan Schlemmer

DAY 1 Thursday 9 February 2012

09.00 Welcome by Royal Society

09.15 Introductory remarks

Professor Takeshi Oka FRS

Session 1: Theory and spectroscopy

Chair: Ralph Jaquet

09.30 Progress in calculating the potential energy surface of H₃⁺

Ludwik Adamowicz

10.00 Discussion

10.15 Spectroscopy of H₃⁺ based on a new high accuracy global PES and DMS

Oleg Polyansky

10.45 Discussion

11.00 Coffee

11.30 Visible transitions from ground-state H₃⁺ and their Einstein B coefficients measured with high-sensitivity action spectroscopy

Annemieke Petrignani

12.00 Discussion

12.15 Lunch

Session 2: Chemistry

Chair: Dieter Gerlich

13.30 Cold trap experiments on the H₃⁺ + O₂ proton transfer

Stephan Schlemmer

14.00 Discussion

14.15 The ortho/para ratio of H₃⁺ in laboratory and astrophysical plasmas

Ben McCall

14.45 Discussion

15.00 Tea

Session 3: Dissociative recombination

Chair: Chris Greene

15.30 The Jahn-Teller effect in the 3pe' Rydberg state of H₃: Review of experimental and *ab initio* studies

Christian Jungen

16.00 Discussion

16.15 Storage ring measurements of the dissociative recombination of H₃⁺

Holger Kreckel

16.45 Discussion

17.00 Dissociative recombination of H₃⁺ ten years in retrospect

Mats Larsson

17.30 Discussion

17.45 CLOSE

19.00 **JJ Thomson H₃⁺**

Centennial Dinner

A controversial molecule: the early history of H₃ and H₃⁺

After-dinner speaker: Helge Kragh

DAY 2 Friday 10 February 2012

Session 4: Cosmic rays

Chair: William Klemperer

09.15 H₃⁺ at the interface between astrochemistry and astro-particle physics

John Black

09.45 Discussion

10.00 The distribution of cosmic-ray ionization rates in diffuse molecular clouds as probed by H₃⁺

Nick Indriolo

10.30 Discussion

10.45 Coffee

Session 5: Galactic center

Chair: Evelyn Roueff

11.00 Exploring the Central Molecular Zone of the Galaxy using spectroscopy of H₃⁺ and CO

Tom Geballe

11.30 Discussion

11.45 Hot, metastable H₃O⁺ in the Galactic Center

Darek Lis

12.15 Discussion

12.30 LUNCH

Session 6: Interstellar chemistry

Chair: Tom Millar

14.00 Hydride spectroscopy of the diffuse interstellar medium: new clues on the fraction of molecular gas and cosmic ray ionization rate in relation with H₃⁺

Maryvonne Gerin

14.30 Discussion

14.45 Using observations of deuterated H₃⁺ and other molecular ions to understand the formation of stars and planets

Floris van der Tak

15.15 Discussion

15.30 Tea

16.00 H₂, H₃⁺ and the age of dark clouds and prestellar cores

Laurent Pagani

16.30 Discussion

Session 7: Planetary ionospheres

Chair: Steven Miller

16.45 H₃⁺ in Gas Giant ionospheres

Tom Stallard

17.15 Discussion

17.30 Closing remarks

Jonathan Tennyson FRS

18.00 CLOSE