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Dr Christopher Mayhew BSc, DIC, PhD, FInsP

Reader in Molecular Physics

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About

Dr. C A Mayhew is Head of the Molecular Physics Group. His group investigates the collisions and interactions of atomic and molecular ions and electrons with gas phase neutral molecular species. This has led to the development of novel instrumentation for studying plasma processes occurring in diverse environments such as the interstellar medium and planetary atmospheres and used in technological processing.

Qualifications

- PhD in Molecular Physics 1985
- BSc Hons 1st Class, Imperial college, 1981

Biography

Following a PhD from Imperial College, Dr. C A Mayhew undertook a number of research positions in Germany and the States. He was awarded a Humboldt Fellowship in 1988 prior to his appointment to the School of Physics and Astronomy as a lecturer in 1989 when he joined the Ionic Physics Group. Since 1990 he has been leading his own research group.

Teaching

- Undergraduate Tutorials
- Second Year Electromagnetism

Postgraduate supervision

Supervision of research PhDs in Molecular Phsyics.

Research

RESEARCH THEMES

- Ion-Molecule Chemistry
- Electron Attachment Processes
- Analytical Chemistry
- Medical Applications

Other activities

- Honorary Senior Researcher Open University

Publications

1. B. Agarwal & F. Petersson, S. Jürschik, P. Sulzer, A. Jordan, T. D. Märk, P. Watts and C. A. Mayhew* “Use of proton transfer reaction time-of-flight mass spectrometry for the analytical detection of illicit and controlled prescription drugs at room temperature via direct headspace sampling” Anal Bioanal Chem. 400 (2011) 2631

2. David A. Steele, Robert D. Short,* Philip Brown, Chris A. Mayhew “On the Use of SIFT-MS and PTR-MS Experiments to Explore Reaction Mechanisms in Plasmas of Volatile Organics: Siloxanes” Plasma Processes and Polymers 8 (2011) 287

3. C. A. Mayhew*, P. Sulzer, F. Petersson, S. Haidacher, A. Jordan, L. Märk, P. Watts and T. D. Märk “Applications of proton transfer reaction time-of-flight mass spectrometry for the sensitive and rapid real-time detection of solid high explosives” Int. J. Mass Spectrom. 289 (2010) 58.

4. P. Brown, P. Watts, T.D. Märk, C.A. Mayhew* “Proton transfer reaction mass spectrometry investigations on the effects of reduced electric field and reagent ion internal energy on product ion branching ratios for a series of saturated alcohols” International Journal of Mass Spectrometry 294 (2010) 103–111.

5. K Graupner, S A Haughey, T A Field, C A Mayhew, T H Hoffmann, O May, J Fedor, M Allan, I Fabrikant, E Illenberger, M Braun, M.-W. Ruf and H Hotop* “Low-energy electron attachment to the dichlorodifluoromethane (CCl2F2) molecule” J. Phys. Chem. 114 (2010) 1474–1484.

6. S. Jürschik*, P. Sulzer, F. Petersson, C. A. Mayhew, A. Jordan, B. Agarwal, S. Haidacher, H. Seehauser, K. Becker, T. D. Märk, “PTR-MS for the sensitive and rapid real-time detection of solid high explosives in air and water” Anal. Bioanal. Chem. 398 (2010) 2813.

7. K Graupner, T A Field* and C A Mayhew “Dissociative electron attachment to the highly reactive difluoromethylene molecule–importance of CF2 for negative ion formation in fluorocarbon plasmas” New Journal of Physics 12 (2010) 083035

8. F. Petersson, P. Sulzer, C. A. Mayhew*, P. Watts, A. Jordan, L, Märk and T.D. Märk. “Real-Time Trace Detection and Identification of Chemical Warfare Agent Simulants using Recent Advances in Proton Transfer Reaction Time-of-Flight Mass Spectrometry” Rapid Commun. Mass Spectrom. 23 (2009), 3875.

9. M E O’Hara, T H Clutton-Brock, S Green, S O’Hehir, and C A Mayhew* “Mass spectrometric investigations to obtain the first direct comparisons of endogenous breath and blood volatile organic compound concentrations in healthy volunteers” Int. J. Mass Spectrom. 281 (2009) 92–96.

10. M E O’Hara, T H Clutton-Brock, S Green, and C A Mayhew* “Endogenous VOCs in breath and blood of healthy volunteers: examining breath analysis as a surrogate for blood measurements” J.Breath Res. 3 (2009) 1-10.

11. S Hall and C A Mayhew* “With a Trace” Physics Review February 2009 24-27.

12. M O’Hara and C A Mayhew* “A preliminary comparison of volatile organic compounds in the headspace of cultures of Staphylococcus aureus grown in nutrient, dextrose and brain heart bovine broths measured using a proton transfer reaction mass spectrometer” J.Breath Res. 3 (2009) 1-8

13. C. A.Mayhew and R. D. Short* “Selected ion flow tube studies to investigate the formation of acrylic and propionic acid protonated clusters in low power, low pressure RF plasmas” Chem. Commun. (2009) 659

14. V A. Mikhailov*, M A Parkes, M J Simpson, R P Tuckett, and C A Mayhew “A selected ion flow tube study of the ion-molecule reactions of monochloroethene, trichloroethene and tetrachloroethene” J.Phys.Chem. 112 (2008) 9012-9022.

15. K Graupner, L M Graham, T A Field , C A Mayhew, I I Fabrikant, T M Miller, M Braun, M W Ruf, and H Hotop* “Highly resolved absolute cross-sections for dissociative electron attachment to SF5CF3” Int. J. Mass Spectrom. 277 (2008) 113–122.

16. S Feil, T D Märk, A Mauracher, P Scheier and C A Mayhew* “Investigations of Electron Attachment to the Perfluorocarbon Molecules c-C4F8, 2-C4F8, 1,3 C4F6,and c-C5F8” Int. J. Mass Spectrom. 277 (2008) 41–51.

17. M O’Hara and C A Mayhew* “Don’t hold your breath! The diagnostic potential of breath analysis” Chemistry Review 18 No. 2 (2008) 13-16.

18. M E O’Hara*, S O’Hehir, S Green and C A Mayhew, “Development of a protocol to measure VOCs in human breath: a comparison of rebreathing and on-line single exhalations using PTR-MS” Physiol. Meas. 29 (2008) 309–330.

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