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RESEARCH FRONT: Liquid Beam Mass Spectrometry

Essay

What is a Liquid Beam?

*Tamotsu Kondow, Fumitaka Mafuné,
Jun-ya Kohno*

Aust. J. Chem. **2006**, *59*, 79–80.

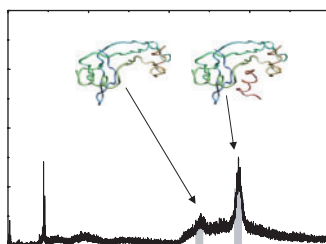
Both surface science and biomolecule analysis, among others, have been widely opened by the advent of liquid beam technologies. Learn more about this scientific frontier in this issue's Research Front.

Review

Time-Resolved Micro Liquid Desorption Mass Spectrometry: Mechanism, Features, and Kinetic Applications

*Ales Charvat, Andreas Bögehold,
Bernd Abel*

Aust. J. Chem. **2006**, *59*, 81–103.



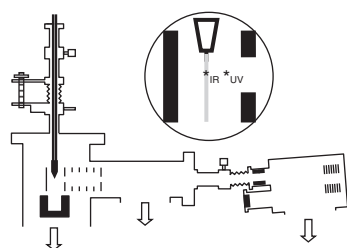
Soft ionization has dramatically widened the scope of mass spectrometry; the title technique now permits liquid state MS analysis. Drawing on examples from biomolecule and polymer studies this review illustrates this conceptually new analytical method.

Rapid Communication

Rotational Energy Distributions of Benzene Liberated from Aqueous Liquid Microjets: A Comparison between Evaporation and Infrared Desorption

*Olivia J. Maselli, Jason R. Gascooke,
Sarah L. Kobelt, Gregory F. Metha,
Mark A. Buntine*

Aust. J. Chem. **2006**, *59*, 104–108.



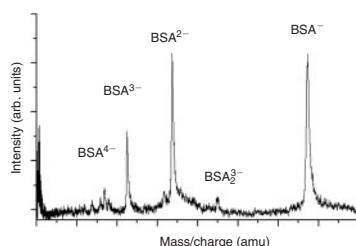
Infrared solute desorption from liquid beams overcome the problem of the thermal decomposition that may arise when low-volatile compounds are heated prior to MS analysis. Using benzene as a model to quantify internal rotational temperatures, evaporated and desorbed benzene have rotational temperatures of 157 and 82 K, respectively. However, careful inspection of the spectral profiles shows that the rotational distributions display a relative overpopulation of the low rotational states.

Full Paper

A New Way To Detect Noncovalently Bonded Complexes of Biomolecules from Liquid Micro-Droplets by Laser Mass Spectrometry

*Nina Morgner, Hans-Dieter Barth,
Bernhard Brutschy*

Aust. J. Chem. **2006**, *59*, 109–114.



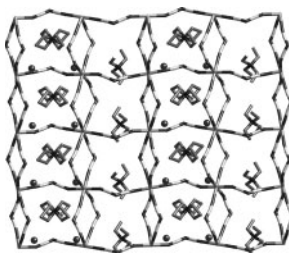
Biomolecules are generally non-volatile, thermally instable, and have their native environment in solution, all of which pose challenges to MS detection. Laser-induced liquid bead ion desorption offers a method to overcome the aforementioned problems yet still meet softness, sensitivity, and specificity demands. The mass spectrum shown is for ionized bovine serum albumin—the sample contains only 5 amol of analyte.

Rapid Communication

Retention of (4,4) Connectivity in the Absence of $\pi\cdots\pi$ Interactions in a Cadmium tris-Dicyanamide Compound

Moumita Biswas, Stuart R. Batten,
Paul Jensen, Samiran Mitra

Aust. J. Chem. **2006**, 59, 115–117.



The first example of a metal tris-dicyanamide compound containing the tetraethylammonium cation shows formation of two-dimensional (4,4) connectivity in the absence of the usual supramolecular interactions.

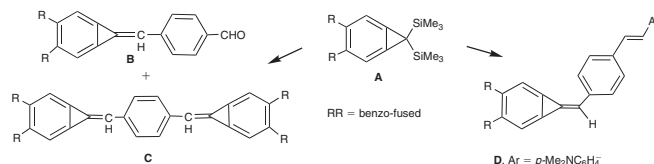
Full Papers

π -Extended Alkylidenecyclopropenes

Brian Halton, Mark J. Cooney

Aust. J. Chem. **2006**, 59, 118–122.

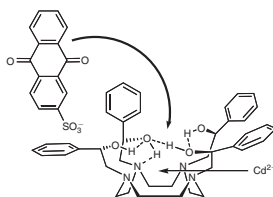
π -Extended cyclopropenes **B** and **C** result from **A**, benzene-1,4-dialdehyde and base; **B** is a minor product. Likewise prepared is stilbene-substituted **D**, highly fluorescent but insoluble.



Structure of the Molecular Receptor 1,4,7,10-Tetrakis[(S)-2-hydroxy-2-phenylethyl]-1,4,7,10-tetraazacyclododecane: A Combined X-Ray Crystallographic and Theoretical Study Producing an Assessment of the Crystal Packing Energy

Christopher B. Smith, Mark A. Buntine,
Stephen F. Lincoln, Max R. Taylor,
Kevin P. Wainwright

Aust. J. Chem. **2006**, 59, 123–128.

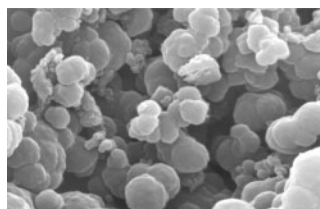


The molecular receptor (*S*)-thpec12, shown, acts as a molecular receptor towards aromatic anions, such as anthraquinone-2-sulfonate, when activated with cadmium(II). The structure of the receptor is investigated using a combined XRD and ab initio study, which leads to a means of estimating the crystal packing energy.

Synthesis and Evaluation of a Molecularly Imprinted Polymer Selective to 2,4,6-Trichloroanisole

Lachlan Schwarz, Michael C. Bowyer,
Clovia I. Holdsworth, Adam McCluskey

Aust. J. Chem. **2006**, 59, 129–134.



Possessing an extremely low flavour threshold, 2,4,6-trichloroanisole (TCA) is the primary agent of the 'mousy' aroma associated with cork taint in wine. Responsible for tainting about 10% of all corked wines, TCA represents a considerable inconvenience to the wine industry. We applied our molecular modelling–NMR titration approach to the generation of molecularly imprinted polymers and designed a MIP system selective to TCA.

