

KN8 Mass Spectrometry of Macromolecules

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Assemblies, dimers, proteins, antibiotics, petroleomics

Disruption of assemblies during electrospray can be controlled

For many, many years, one of the biggest challenges in mass spectrometry was volatilising non-volatile, thermally labile molecules without thermal degradation. How could all the weak interactions holding a molecule in the condensed phase be broken without at the same time rupturing relatively weak bonding interactions within the molecule? This challenge was taken up in serious fashion in Jim Morrison's Department at La Trobe University in the 1970's. Progress since around the globe has been so spectacular that now the claim might be that all the non-covalent interactions restraining a molecular assembly in the condensed phase are picked apart without disrupting the non-covalent interactions within the assembly.

A critical look is taken at the study of molecular assemblies by electrospray ionisation, with the focus on proteins, antibiotics and naphthenic acids and Fourier transform ion cyclotron resonance (FTICR), magnetic sector (MMM) and time-of-flight (TOF).

Results with the above instruments and sample-types using the ion conveyor will be presented and discussed. The ion conveyor allows control over collision energies and the results using this device provide insight into formation and disruption of molecular assemblies.