

Department of Chemistry, IIT Madras

PhD Research Proposal Seminar I

Mass Spectrometry: Evolution from Analytical Methods to Preparative Processes

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Venue: Through Online Link

Date: 10.02.2021

Time: 3 pm

Abstract

Mass spectrometry, a century-old technique, has played a key role in analytical chemistry due to its high molecular sensitivity. Since 1898, when German physicist Wilhelm Wien first laid the foundation of mass spectrometry, it has undergone tremendous development in terms of its working principle, instrumentation, and applications. Branches of mass spectrometry have spread in several analytical sciences for molecular characterization e.g., food analysis, material science, forensics, biological sciences, space sciences, medical diagnostics, petrochemistry, etc. Alongside, materials have made major inroads into mass spectrometry over the last 10 years. Advanced micro/nanomaterials have helped in enhanced ionization, easy sampling, selective ionization of complex mixtures, performing chemistry, etc. However today, mass spectrometry is not only an analytical tool but used as a preparative process for the synthesis of material. This form of mass spectrometry is termed 'preparative mass spectrometry' whose roots were found in 1977. Synthesis of several nanomaterials and small organic molecules using preparative mass spectrometry has been demonstrated in recent literatures. Herein, we have discussed the evolution of mass spectrometry from being an analytical tool to become a preparative process.

Reference:

- 1) Sparkman, O.D. Mass Spectrometry: Overview and History. In Encyclopedia of Analytical Chemistry (eds R.A. Meyers and O.D. Sparkman), 2006.
- 2) Narayanan, R., Sarkar, D., Cooks, R.G. and Pradeep, T., Molecular Ionization from Carbon Nanotube Paper. Angew. Chem. Int. Ed., 2014, 53: 5936-5940.
- 3) Stephan Rauschenbach, Markus Ternes, Ludger Harnau, Klaus Kern, Annual Review of Analytical Chemistry 2016 9:1, 473-498

Guide

Seminar Coordinator

Head of Department