

JOURNEY OF MASS SPECTROMETRY

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From decades spectrometry has been accepted as a key analytical tool for understanding and characterization of molecules in chemistry, the level of world-wide research activity in this field promises that these capabilities will continue to improve, rapidly. Over the period of time sensitivity of spectroscopy tools have been improved to work at micro level and in more depth, ultimately become a faster research tool; such tools now being used as process analytical tools (PAT) giving online understanding of characteristics of a molecule during research/development and in production. Same time their utilization has widen up by coupling these tools with liquid chromatography, and thermal measurement tools e.g. (LC-MS-MS, LC-NMR, DSC-FTIR.....etc.). Mass spectroscopy has achieved horizons from single quadrupole to triple quadrupole, MS-TOF & the Matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF-MS) these have become a powerful and widespread analytical tool in life science and health sector. The dynamic mass range (1-300 kDa), high accuracy and sensitivity make it a superior method for analysis of all kinds of biomolecules including proteins, nucleic acids, metabolites and carbohydrates. Particularly in drug discovery, where compound identification and purity from synthesis and early pharmacokinetics are determined, MS has proved indispensable outcomes. Today, the MS practitioner can choose among a range of ionization techniques which have become robust and trustworthy on a variety of instruments with demonstrated capabilities. In combination with 2D-electrophoresis, MALDI-TOF-MS is particularly suitable for the identification of protein spots via mass fingerprint or micro sequencing. Same time MS-TOF is widely used in pharmaceutical word, TOF has improved the sensitivity by increasing the path length in TOF tube, so ion remain in path of light for longer time increasing sensitivity, on other side measurement tolls has been improved to see the mass number in several digits can differentiate molecules having closure mass and differentiating isotopes. Software calculates elemental formula, for which confirmation performed by comparing theoretical fragments to the obtained TOF-MS/MS of molecule. In this review I had evaluated and focused on advancement and updates in MS field, with respect to technology update & applications.

BIOGRAPHY

Lokesh Kumar Gupta has completed his PhD at the age of 25 years by researching in University of Delhi and Ch. CS University Meerut, India. He is an analytical research scientist and serving as Chief Manager of Analytical R&D team with TEVA India (a world leader in generic pharmaceuticals). Focusing on pharmaceutical-research, cGMP compliance aspects and conducting technical trainings to pharmaceutical scientists. He is participating and discussing his commended research in several national/international seminars/conferences. Apart from several awards and recognitions, Dr. Gupta had published 45 research articles in peer reviewed reputed journals of chemistry & spectroscopy and serving as an eminent referee for several journal of international repute.

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