

# DEVELOPMENT OF AMBIENT MASS SPECTROMETRY AND NEW DESORPTION METHOD FOR NON-VOLATILE COMPOUNDS

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**M**ass spectrometry (MS) has been considered as a versatile analytical tool in the field of analytical science because it provides molecular structural information of analyte compounds. Therefore, MS technique has been extensively used in the branches of chemistry along with proteomics, metabolomics, genomics, lipidomics etc. Recent research on MS imaging for biological samples exhibited a promising diagnostic tool for cancer diagnosis. Almost all types of compounds exist as neutral form except proteins, peptides, nucleic acids which exist inherently ionic in nature. In MS, an ionization source which is considered as the heart of the MS has been used to ionize the neutral molecules. Performance of MS in terms of quantification depends on the efficiency of the ion source. Therefore development of an efficient ion source is needed. Traditional ion sources like chemical ionization (CI), electron ionization (EI), electrospray ionization (ESI) need high vacuum system which make the MS heavier and bulky where miniature MS is very much needed for practical applications. Development of ambient ion source would be the choice to fabricate miniature MS. Attempts have been paid to develop an ambient ion source for analysis of various compounds with better limit of detection. Further attempt has been taken to develop new desorption method for non-volatile compounds. This is because in MS, the analyte compounds must be released in gas phase and then ionizes by a suitable ion source. There are two representative methods for gasification of condensed samples, i.e., ablation and desorption. Flash heating/rapid cooling, solid/solid friction, liquid/solid friction etc. have been developed as desorption methods for non-volatile compounds. All the methods are concerned with the surface and interface phenomena. Mechanism of ion formation and better ionization efficiency of new ion sources and concept of how to desorb less-volatility compounds from the surface will be discussed.

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