

E2-38 An investigation on the applicability of plasma desorption mass spectrometry in the study of natural product compounds

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Plasma desorption mass spectrometry (PDMS) which is being especially applied in the mass analysis of heavy organic molecules has been used in the present work to explore its capability in the analysis of low mass natural product compounds. In this technique, impact of fission fragments from a ²⁵²Cf radioactive source desorb (sputter) secondary ions from a solid sample surface and the secondary ions are mass analysed using a time-of-flight mass analyser.

Several natural product compounds including some of those in the groups of furoquinoline alkaloids and coumarines, in the molecular weight range of 200-400 μ , isolated from a medicinal plant (*Aegle marmelos*) grown in Sri Lanka have been used in this study. Compounds analysed were Skimmianine, Iso-skimmianine, Dictamine, γ -Fagarine, Haplopinine, Marmin, Lupeol, Umbelliferone, Girinimbine and Brucine.

It has been demonstrated that in most cases, quasi-molecular ions (e.g. (M+H)⁺ and (M-H)⁻) and in a few cases molecular ion (M⁺) (e.g. Fig. (a) and (b)) can be produced from the natural product compounds using PDMS. Molecular weight information can be derived using quasi-molecular ion peaks, the fragment and the adduct ion peaks.

Compounds studied show some different fragmentation and adduction patterns in PDMS compared to those observed in electron impact ionization mass spectrometry along with some similarities. This property may be further useful for the natural product chemist in the structural determination of new compounds.

Consumption of only a few μ g of a compound, the recoverability of a major percentage (e.g. 90%) of the sample after use and less fragmentation of molecular ions can be cited as some of the advantages of PDMS over the other conventional mass spectrometric methods. One of our major goals is to develop this new technique, PDMS, for wide application in natural product chemistry research in Sri Lanka.

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Fig. 1 Positive ion mass spectra of (a) skimmianine (MW 259 μ) and (b) brucine (MW 394 μ) obtained from the plasma desorption mass spectrometer built at the Dept of Physics, University of Colombo.