

interfaced with mass spectrometry and the combination is a very powerful identification/analytical technique. Detection levels using conventional detectors are at the nanogram level or less but with the mass spectrometry system much lower levels are achieved. Enzyme inhibitors can be detected at the picogram level with an enzymatic detection system.

Although originally devised as a separation technique the continued development of HPLC now enables it to be used for tests of purity on reference compounds, for quantitative measurements using peak areas as described for GC, for identification of known compounds as for GC (provided an authenticated reference sample of the compound in question is available) and for the analysis of individual compounds in complex matrices. In many respects HPLC has capabilities analogous to those of GC provided the limitations presented by the more limited range of detectors is borne in mind and the fact that it utilises liquid eluents at ambient temperature rather than a gas stream at elevated temperatures.

### Mass Spectrometry

Mass spectrometry is a very powerful analytical technique which is used for

- a) the elucidation of the structure of unknown compounds;
- b) the positive identification of known compounds;
- c) the monitoring of known compounds; and
- d) the measurement of known compounds at trace levels.

The principle of mass spectrometry relies on the ionisation of the material to be analysed. The sample is introduced, directly or by an appropriate indirect technique such as GC, into the ionisation region of the instrument where it is ionised by any one of a variety of ionisation techniques, such as electron ionization (EI) or chemical ionization (CI); the parent ion fragments in a controlled manner to give a characteristic pattern of fragment ions which travel through the analyzer in which the ions are sorted out on the basis of their mass to charge ratio. The ion current collected for each ion is a measure of the amount of the ion present, and the amount of the parent substance to be measured.

The structure elucidation of unknown compounds almost invariably requires the use of sophisticated high resolution mass spectrometers giving the elemental composition of the ions. Daughter- and parent ion spectra can be obtained by tandem mass spectrometry by collision activation (MS/MS) or by linked scan