(different detectors, different chromatographic columns, different temperature programmes etc.), and samples of authenticated reference compounds are analysed under the identical conditions, then repeated coincidence of chromatographic peaks can be used to give a very high probability of compound identification. This technique, based on retention index monitoring (RIM) is of particular value when the presence of one particular compound out of a limited number of possible compounds is suspected as being present; this might well be the case, for example, in many inspection/verfication situations.

GC can also be used to determine the quantity of any one component present in a mixture. This is achieved by comparing peak areas of individual peaks in the chromatogram with those of authentic reference standards at a range of similar concentrations.

Finally, in this Section, mention must be made of the very powerful analytical methods resulting from the interfacing of GC with such advanced chemical identification techniques as Mass Spectrometry and more recently with Fourier Transform Infra-Red Spectrometry. These combined techniques now comprise the most powerful and most sophisticated instruments available to analytical chemists for the analysis and identification of components in mixtures, for the identification and analysis of a single compound (or relatively few compounds) in a complex matrix and for determining the purity and authenticity of a single compound.

High Performance Liquid Chromatography

High performance liquid chromatography (HPLC), like GC, is primarily a method of separating mixtures of compounds into the individual components. However, since the separations are carried out at ambient temperature using liquid eluents rather than a flowing gas stream, HPLC is particularly well suited to the analysis of thermally labile or non-volatile compounds. The separation is achieved by partition of the mixture between a stationary phase, supported in a column, and a flowing liquid eluent. The nature of the supported phase and of the eluent (which can be varied very widely and may include mixed solvents) control the separation which can be achieved. In contrast to GC only a relatively limited number of detection techniques are available for the detection of the chromatographic peaks as they are eluted from the column; probably the most commonly used detector uses UV/visible spectrometry although other detectors are available. As with GC, this technique is now being