A combination of a gas chromatograph used with RIM-capability and coupled either to a mass spectrometer or to an infrared spectrometer was considered sufficiently reliable. If the retention behaviour and either a mass spectrum or an infrared spectrum corresponds to that of a declared compound, the compound is considered as identified. The comparison of retention indexes and spectra with those in the database is satisfactory. If either of the two parameters gives negative result, the sample could be subjected to a detailed analysis in a designated laboratory.

b) Unambiguous identification of compounds for the verification of undeclared activities such as alleged use and challenge inspection situations.

Unambiguous identification of compounds for the verification of undeclared activities requires always confirmatory analyses to be done in a designated laboratory and positive results should be obtained with at least two sophisticated instruments before the chemical is considered identified. The concentration level of the samples would determine the choice of the identification technique. For rather concentrated samples (10μ g/ml) either LREI/CIMS + GC-FTIR and NMR 1H, 13C, 31P and 19F can be used. For diluted samples MS/MS or HRMS and GC-MI-FTIR must be applied.

4. Structure elucidation of unknown compounds

Combined use of all spectrometric and chromatographic techniques as well as use of instrumental databases are required. Structure elucidation must always be carried out in an off-site laboratory.

5. Semiquantification

In verification activities semiquantification is needed to tell only the percentage of the compound in the sample. Various techniques can be used for these determinations.

The best suited techniques are gas and liquid chromatography in relatively pure sample matrices. If there is background, MS coupled to a GC is required. In complex background cases either the GC is used in a two-stage mode or the MS has to be HRMS or MS/MS. 13C NMR and 31 P NMR are suitable for concentrated formulates of agents.