

IRD 3 Application Brief

Analysis of Industrial Solvents

Introduction

When coupled with a GC system the ASAP Analytical IRD 3 comprise a very powerful tool for performing a quick qualitative screen of a complex mixture. One area where this is of particular importance is in the analysis for commonly used industrial solvents. These chemicals are widely used in a variety of applications in industries such as paint and coatings, photography, printing and cosmetics.

In the quality control lab environment the analysis of these materials is normally routine. However, there are times when an “unknown” appears due perhaps to a process change or to a new vendor supplying starting materials. In the case of the laboratory responsible for monitoring waste chemical disposal unknown identification is even more likely to be required. Identification by GC retention time alone is time consuming and not conclusive. Mass spectral analysis provides very good evidence of identity of solvents with the exception of positional isomers such as ortho-, meta-, para-xylenes and other substituted aromatics. In

addition to being an excellent qualitative tool the optimum analyzer for these widely used materials must have sufficient sensitivity to identify them at low levels.

Results

Figure 1 is Gram-Schmidt chromatogram of a mixture of neat solvents in approximately equal concentrations. This chromatogram provides a good indication of the relative response of the IRD for different classes of compounds. For example, compounds with a carbonyl functional group (C=O) such as esters and ketones are strong infrared absorbers and show a much greater response than the hydrocarbon type solvents.

The power of the IRD is exemplified by the fact that with just one injection these solvents, including the correct isomer of xylene, were unambiguously identified by their characteristic infrared spectra.

Conclusion

This example illustrates the ability of the IRD to conveniently and accurately identify common solvents in a wide range of concentrations and sample matrices. Another distinct advantage of the IRD compared to other detectors such as flame ionization or mass spectrometry is its non-destructive nature allowing for collection and/or further types of analysis when necessary.

