

## BOOK REVIEW

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### Review of GC-MS Guide to Ignitable Liquids

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**REFERENCE:** Newman, Reta, Gilbert, Michael, and Lothridge, Kevin. *GC-MS Guide to Ignitable Liquids*, CRC Press, New York 1998, 750 pages; \$89.95

It is rare to find a book published for forensic examiners who perform fire debris analysis. This book addresses two issues for those involved in the identification of ignitable liquids recovered from fire debris; first, the increased availability of "speciality solvents" which do not fall into the five main categories of more familiar and easily recognizable ignitable liquids and, second, the increased use of mass spectrometry for the identification of ignitable liquids.

The book contains gas chromatograms and mass chromatograms for over 100 ignitable liquids representative of commercial products available today. This data is not intended to be used as a library of ignitable liquids for identification purposes. Rather, as the title states, it is to be used as a guide for classifying the wide variety of products available today.

The Introduction contains a discussion of ignitable liquid classification and the use of extraction ion chromatography (mass chromatograms) for the identification of these products. The authors also present characteristic information on each ASTM class of ignitable liquids. The Introduction finishes with an outline on how to use the book to get guidance on what type of ignitable liquid the examiner has encountered and a flow chart of systematic steps to be used in ignitable liquid identification.

The bulk of the book, the Data portion, contains representative chromatograms from each ASTM E 1387 - 95 class of ignitable

liquids.<sup>2</sup> The data includes a Total Ion Chromatogram (TIC), summed ion profiles for alkanes, aromatics, cycloparaffins and alkenes, and naphthalenes, and finally individual ion profiles for characteristic ions for alkanes, aromatics, cycloparaffins, and naphthalenes. The summed ion profiles provide a good overview of the classes of compounds present in the product. The individual profiles are useful when patterns that are more definitive are needed for differentiation. Production information includes commercial brand name and product uses.

While the data presented is very valuable, and definitely the meat of the text, the information in the Introduction is of particular value in providing guidance on the interpretation of GC-MS data. For those unfamiliar with using MS data for interpretation and identification of ignitable liquids, mass spectral information initially can be overwhelming and somewhat confusing. The Introduction clearly outlines both the advantages of and the process for using mass spectral data for ignitable liquid identification.

The Appendices also contain useful information. Appendix A contains computer programs for producing Total and Extracted Ion Profiles. While written for the Hewlett Packard Chemstation software, the information can be adapted for other software programs. Appendix B is a table outlining the hydrocarbon range and ASTM Class of every product shown in the Data portion. Another appendix identifies oxygenated compounds present in the products in the oxygenated class. The Index provides a quick guide for locating a particular ignitable liquid in the Data portion.

While no data compilation can or should substitute for the examiner's own library of ignitable liquid standards, this text is a valuable resource for anyone performing fire debris analysis.

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<sup>2</sup> Standard Test Method for Ignitable Liquid Residues in Extracts from Fire Debris Samples by Gas Chromatography.