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Sommario/riassunto

Essential handbook for all analytical scientists and laboratories using GC-MS, covering both the fundamental and practical aspects of this analytical technique From essentials to applications, Handbook of GC-MS:Fundamentals and Applications is a comprehensive reference and training compendium on the popular and evolving technique of GC-MS (gas chromatography/mass spectrometry), guiding readers through the most used sample preparation methods for GC-MS and method development, with many practical indications supporting the design of optimized analyses, and providing practical approaches to data processing, compound identification, and quantification. The text details both a solid background and principles of operation, as well as a broad range of current real-life examples taken from laboratories in environmental, food, pharmaceutical, and forensic analysis. It also features a glossary of more than 300 terms, and a comprehensive substance index that facilitates finding a specific application. This timely Fourth Edition covers the latest developments in automated sample preparation techniques and instrumentation, also with the focus on Green Analytical Chemistry. This comprehensive handbook presents GC-MS applications in various fields, with coverage of the well-known QuEChERS pesticide extraction, solid phase extraction and solid phase microextraction, static and dynamic headspace analysis, liquid/liquid extraction, outgassing, and thermal desorption, including pyrolysis. Single and triple quadrupole, Orbitrap, time-of-flight, magnetic sector, ion mobility and isotope ratio MS are discussed with their advantages and limitations. Sample topics covered in Handbook of GC-MS: Fundamentals and Applications include: Sample inlet systems for hot needle, liquid band injection with large volume and LC-GC application, carrier gas saving, choice of columns, septa and injection port liners Optimization of the GC method with carrier gas flow, effect of oven temperature ramp rates, fast GC, and multi-dimensional gas chromatography Ionization processes, electron and chemical

ionization, resolution power in mass spectrometry, reading and interpreting mass spectra Extraction of mass spectra, manual spectrum subtraction, deconvolution of mass spectra, retention index, and library search of mass spectra Typical mass spectra of common analyte groups like pesticides, persistent organic pollutants, drugs; explosives; and of frequently occurring impurities Quantification using external and internal standards and standard addition methods. Determination of the limits of detection and quantitation. Applications covering food, water, flavor and fragrance, metabolomics, forensic and material analysis The Handbook of GC-MS: Fundamentals and Applications is an essential reference for the daily GC-MS practice and application of new methods. It serves as an excellent introduction for newcomers as well as an educational resource about this analytical technique. Analytical chemists, chromatographers, environmental chemists, food chemists, and pharmaceutical chemists will find it of high practical use.