

1. Record Nr.	UNINA9911019891103321
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Titolo	Static headspace-gas chromatography : theory and practice // Bruno Kolb and Leslie S. Ettre
Pubbl/distr/stampa	Hoboken, N.J., : Wiley, c2006
ISBN	9786610448197 9781280448195 1280448199 9780470325988 0470325984 9780471914587 0471914584 9780471914563 0471914568
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (377 p.)
Altri autori (Persone)	EttreLeslie S
Disciplina	543/.85
Soggetti	Gas chromatography
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Static Headspace-Gas Chromatography; Contents; Preface; Preface to the First Edition; List of Acronyms and Symbols; 1 General Introduction; 1.1 Principles of Headspace Analysis; 1.2 Types of Headspace Analysis; 1.2.1 Principles of Static HS-GC; 1.2.2 Principles of Dynamic HS-GC; 1.2.2.1 The Trap; 1.2.2.2 The Water Problem; 1.2.2.3 The Flow Problem; 1.2.2.4 The Time Problem; 1.2.2.5 Comparison of Static HS-GC with P&T; 1.3 The Evolution of the HS-GC Methods; 1.4 HS-GS Literature; 1.5 Regulatory Methods Utilizing (Static) HS-GC; References; 2 Theoretical Background of HS-GC and Its Applications 2.1 Basic Theory of Headspace Analysis2.2 Basic Physicochemical Relationships; 2.3 Headspace Sensitivity; 2.3.1 Influence of Temperature on Vapor Pressure and Partition Coefficient; 2.3.1.1 Enhancement of Lower Boiling Compounds; 2.3.2 Influence of Temperature on Headspace Sensitivity for Compounds with Differing Partition Coefficients; 2.3.3 Influence of Sample Volume on Headspace

Sensitivity for Compounds with Differing Partition Coefficients; 2.3.3.1 Sample-to-Sample Reproducibility; 2.3.4 Changing the Sample Matrix by Varying the Activity Coefficient; 2.4 Headspace Linearity 2.5 Duplicate Analyses 2.6 Multiple Headspace Extraction (MHE); 2.6.1 Principles of MHE; 2.6.2 Theoretical Background of MHE; 2.6.3 Simplified MHE Calculation; References; 3 The Technique of HS-GC; 3.1 Sample Vials; 3.1.1 Vial Types; 3.1.2 Selection of the Vial Volume; 3.1.3 Vial Cleaning; 3.1.4 Wall Adsorption Effects; 3.2 Caps; 3.2.1 Pressure on Caps; 3.2.2 Safety Closures; 3.3 Septa; 3.3.1 Septa Types; 3.3.2 Septum Blank; 3.3.3 Should a Septum Be Pierced Twice?; 3.3.3.1 Closed-Vial versus Open-Vial Sample Introduction Technique; 3.4 Thermostatting; 3.4.1 Influence of Temperature 3.4.2 Working Modes 3.5 The Fundamental Principles of Headspace Sampling Systems; 3.5.1 Systems Using Gas Syringes; 3.5.2 Solid Phase Microextraction (SPME); 3.5.2.1 Comparison of the Sensitivities in HS-SPME and Direct Static HS-GC; 3.5.3 Balanced Pressure Sampling Systems; 3.5.4 Pressure/Loop Systems; 3.5.5 Conditions for Pressurization Systems; 3.5.6 Volume of the Headspace Gas Sample; 3.5.6.1 Sample Volume with Gas Syringes; 3.5.6.2 Sample Volume with Loop Systems; 3.5.6.3 Sample Volume with the Balanced Pressure System; 3.6 Use of Open-Tubular (Capillary) Columns 3.6.1 Properties of Open-Tubular Columns for Gas Samples 3.6.2 Headspace Sampling with Split or Splitless Introduction; 3.6.3 Comparison of Split and Splitless Headspace Sampling; 3.6.4 Band Broadening During Sample Introduction; 3.6.5 Influence of Temperature on Band Broadening; 3.6.5.1 Conclusions; 3.6.6 The Combination of Different Columns and Detectors; 3.7 Enrichment Techniques in HS-GC; 3.7.1 Systems for Cryogenic Trapping; 3.7.1.1 Trapping by Cryogenic Condensation; 3.7.1.2 Trapping by Cryogenic Focusing; 3.7.1.3 Influence of Temperature on Cryogenic Focusing 3.7.1.4 Comparison of the Various Techniques of Cryogenic Trapping

Sommario/riassunto

The only reference to provide both current and thorough coverage of this important analytical technique Static headspace-gas chromatography (HS-GC) is an indispensable technique for analyzing volatile organic compounds, enabling the analyst to assay a variety of sample matrices while avoiding the costly and time-consuming preparation involved with traditional GC. Static Headspace-Gas Chromatography: Theory and Practice has long been the only reference to provide in-depth coverage of this method of analysis. The Second Edition has been thoroughly updated to reflect the most recent