

1. Record Nr.	UNINA9910827002703321
Titolo	Infrared and Raman spectroscopy in forensic science // edited by John M. Chalmers, Howell G. M. Edwards, Michael D. Hargreaves
Pubbl/distr/stampa	Chichester, West Sussex, UK ; ; Hoboken, : Wiley, 2012
ISBN	1-283-40976-3 9786613409768 1-119-96232-3 1-119-96233-1
Edizione	[1st. ed.]
Descrizione fisica	1 online resource (680 p.)
Collana	THEi Wiley ebooks
Altri autori (Persone)	ChalmersJohn M EdwardsHowell G. M. <1943-> HargreavesMichael D
Disciplina	363.25/6
Soggetti	Forensic sciences Infrared spectroscopy Raman spectroscopy Criminal investigation
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	Infrared and Raman Spectroscopy in Forensic Science; Contents; About the Editors; List of Contributors; Preface; SECTION I: INTRODUCTION; 1 Introduction and Scope; 1.1 Historical Prologue; 1.2 The Application of Infrared Spectroscopy and Raman Spectroscopy in Forensic Science; References; 2 Vibrational Spectroscopy Techniques: Basics and Instrumentation; 2.1 Introduction; 2.2 Vibrational Spectroscopy Techniques; 2.2.1 The basics and some comparisons; 2.2.1.1 Wavelength/Wavenumber Ranges and Selection Rules; 2.2.1.2 Sampling Considerations 2.2.1.3 Sensitivity, Surfaces and Signal Enhancement Techniques 2.2.1.4 IR and Raman Bands; 2.2.2 Quantitative and classification analyses; 2.2.2.1 Multivariate Data Analyses; 2.2.2.2 Data Pre-Processing; 2.2.3 Reference databases and search libraries/algorithms; 2.3 Vibrational Spectroscopy: Instrumentation; 2.3.1 Spectrometers; 2.3.1.1 Sources; 2.3.1.2 Detectors; 2.3.1.3 Spectrometers and

Interferometers; 2.3.2 Vibrational spectroscopy-microscopy systems; 2.3.2.1 Mapping and Imaging; 2.3.3 Fibre optics and fibre-optic probes 2.3.4 Remote, portable, handheld, field-use, and stand-off vibrational spectroscopy instrumentation 2.4 Closing Remarks; References; 3 Vibrational Spectroscopy Sampling Techniques; 3.1 Introduction; 3.2 Vibrational Spectroscopy: Sampling Techniques; 3.2.1 Raman spectroscopy; 3.2.1.1 Raman Spectroscopy: Sampling Techniques and Considerations; 3.2.1.2 Resonance Raman Spectroscopy; 3.2.1.3 Surface Enhanced Raman Spectroscopy and Surface Enhanced Resonance Raman Spectroscopy; 3.2.1.4 Spatially Offset Raman Spectroscopy; 3.2.1.5 Transmission Raman Spectroscopy 3.2.1.6 Raman Microscopy/Microspectroscopy and Imaging 3.2.1.7 Remote and Fibre-Optic Probe Raman Spectroscopy; 3.2.2 Mid-infrared spectroscopy; 3.2.2.1 Mid-Infrared Transmission Spectroscopy: Sampling Techniques; 3.2.2.2 Mid-Infrared Reflection Spectroscopy Sampling Techniques; 3.2.2.3 Mid-Infrared Photoacoustic Spectroscopy; 3.2.2.4 Mid-Infrared Microscopy/Microspectroscopy and Imaging; 3.2.3 Near-infrared spectroscopy: sampling techniques; 3.2.3.1 Near-Infrared Transmission Spectroscopy; 3.2.3.2 Near-Infrared Diffuse Reflection Spectroscopy; 3.2.3.3 Near-Infrared Transflection Spectroscopy 3.2.3.4 Near-Infrared Spectroscopy: Interactance and Fibre-Optic Probe Measurements 3.2.3.5 Near-Infrared Microscopy and Imaging; 3.2.4 Terahertz/far-infrared spectroscopy: sampling techniques; 3.3 Closing Remarks; Acknowledgements; References; SECTION II: CRIMINAL SCENE; 4 Criminal Forensic Analysis; 4.1 Introduction; 4.2 Forensic Analysis; 4.3 General Use of IR and Raman Spectroscopy in Forensic Analysis; 4.3.1 Progression of infrared spectroscopy development in forensic analysis; 4.3.2 Progression of Raman spectroscopy development in forensic analysis; 4.3.3 Sampling methods 4.3.3.1 Microscopes

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Sommario/riassunto

This book will provide a survey of the major areas in which information derived from vibrational spectroscopy investigations and studies have contributed to the benefit of forensic science, either in a complementary or a unique way. This is highlighted by examples taken from real case studies and analyses of forensic relevance, which provide a focus for current and future applications and developments.

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