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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

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.