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Altri autori (Persone)	SieslerH. W. <1943->
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Nota di contenuto	Near-Infrared Spectroscopy Principles, Instruments, Applications; Contents; Foreword; List of Contributors; 1 Introduction; 1.1 General Remarks; 1.2 Basic Principles of Vibrational Spectroscopy; 1.3 Instrumentation; 1.4 Process-Monitoring; 1.5 References; 2 Origin of Near-Infrared Absorption Bands; 2.1 Introduction; 2.2 Principles of Near-Infrared Spectroscopy; 2.2.1 The Diatomic Molecule; 2.2.1.1 The Harmonic Oscillator; 2.2.1.2 Anharmonic Oscillator; 2.2.2 The Polyatomic Molecule; 2.2.2.1 Harmonic Approximation; 2.2.2.2 Influence of Anharmonicity; 2.2.2.3 Degenerate Vibrations 2.2.2.4 Symmetry Considerations2.2.2.5 Fermi and Darling-Denison Resonances; 2.3 Chemical Assignments of NIR Bands; 2.3.1 Group Frequencies; 2.3.1.1 C-H Absorptions; 2.3.1.2 O-H Absorptions; 2.3.1.3 N-H Absorptions; 2.3.2 Deuteration; 2.3.3 Polarisation Measurements; 2.3.4 Two-Dimensional Correlation Spectroscopy; 2.4 Conclusion; 2.5 References; 3 Instrumentation for Near-Infrared Spectroscopy; 3.1 Configuration of Near-Infrared Spectrometers; 3.2 Interference-Filter Spectroscopy; 3.2.1 Principle of Interference-Filter

Spectroscopy; 3.2.2 Wavelength Scanning
 3.3 Diffraction-Grating Spectroscopy 3.3.1 Principle of Diffraction-Grating Spectroscopy; 3.3.2 Wavelength Scanning for Grating Spectroscopy; 3.3.3 Multichannel Spectroscopy with a Polychromator; 3.3.4 Production Methods of Reflection-Type Diffraction Gratings; 3.4 Spectroscopy with Acousto-Optical Diffraction Gratings; 3.4.1 Schematics of Acousto-Optical Diffraction Gratings; 3.4.2 Characteristics of Spectroscopy by Bragg Diffraction; 3.4.3 Application and Materials of Acousto-Optical Elements; 3.5 Fourier-Transform Spectroscopy; 3.5.1 Principle of Fourier-Transform Spectroscopy 3.5.2 Characteristics of Fourier-Transform Spectroscopy 3.5.2.1 Optical Throughput Advantage; 3.5.2.2 Multiplexing Advantage; 3.5.2.3 Resolution; 3.5.3 Various Types of Michelson Interferometer; 3.5.4 Polarisation Interferometer; 3.5.5 FT-NIR Raman Spectroscopy; 3.6 Multichannel Fourier-Transform Spectroscopy; 3.6.1 Principle of Multichannel Fourier-Transform Spectroscopy; 3.6.2 Multichannel Fourier-Transform Spectroscopy with a Polarising Interferometer with a Savart Plate; 3.7 Comparison of Spectrometers; 3.8 References; 4 New Techniques in Near-Infrared Spectroscopy
 4.1 Near-Infrared Light Sources 4.1.1 Thermal Radiation; 4.1.1.1 Tungsten Halogen Lamp; 4.1.1.2 Nichrome Heater and Globar; 4.1.2 Laser and Light Emitting Diode; 4.1.2.1 Light Emitting Diode and Semiconductor Laser; 4.1.2.2 Other Lasers; 4.2 Near-Infrared Detectors; 4.2.1 Photoconduction Effect; 4.2.2 The Photovoltaic Effect; 4.2.3 Multi-Channel Detectors; 4.3 Optical Elements for the Near-Infrared Region; 4.4 References; 5 Near-infrared FT-Raman Spectroscopy; 5.1 Introduction; 5.2 Principles of FT-Raman Spectrometry; 5.2.1 Raman Scattering; 5.2.2 FT-Raman Measurement 5.2.3 Apodisation Function and Line Shape

Sommario/riassunto

Over the last few years, near-infrared (NIR) spectroscopy has rapidly developed into an important and extremely useful method of analysis. In fact, for certain research areas and applications, ranging from material science via chemistry to life sciences, it has become an indispensable tool because this fast and cost-effective type of spectroscopy provides qualitative and quantitative information not available from any other technique. This book offers a balanced overview of the fundamental theory and instrumentation of NIR spectroscopy, introducing the material in a readily comprehensible m

2. Record Nr.	UNINA9910699642203321
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Descrizione fisica	1 online resource (i, 60 pages) : illustrations, maps
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