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| Autore | Hanson Ronald K |
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| Descrizione fisica | 1 online resource (XXV, 279 p. 140 illus., 40 illus. in color.) |
| Disciplina | 620.1064 |
| Soggetti | Fluid mechanics<br>Atomic structure<br>Molecular structure<br>Materials science<br>Engineering—Materials<br>Engineering Fluid Dynamics<br>Atomic/Molecular Structure and Spectra<br>Characterization and Evaluation of Materials<br>Materials Engineering |
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| Nota di contenuto | Introduction -- Diatomic Molecular Spectra -- Bond Dissociation Energies -- Polyatomic Molecular Spectra -- Effects of Nuclear Spin -- Rayleigh & Raman Spectra -- Quantitative Emission and Absorption -- Spectral Lineshapes -- Electronic Spectra of Atoms -- Electronic Spectra of Diatomics -- Laser-Induced Fluorescence -- Diagnostic Techniques -- Spectroscopy Equipment -- Case Studies -- Glossary -- Voigt Tables -- Voigt Fitting Program -- HITRAN Database -- Center of Symmetry -- Fluorescence Yield: Multi-level Models. |
| Sommario/riassunto | This text provides an introduction to the science that governs the interaction of light and matter (in the gas phase). It provides readers with the basic knowledge to exploit the light-matter interaction to develop quantitative tools for gas analysis (i.e. optical diagnostics) and understand and interpret the results of spectroscopic measurements. The authors pair the basics of gasphase spectroscopy with coverage of |

key optical diagnostic techniques utilized by practicing engineers and scientists to measure fundamental flowfield properties. The text is organized to cover three subtopics of gasphase spectroscopy: (1) spectral line positions, (2) spectral line strengths, and (3) spectral lineshapes by way of absorption, emission, and scattering interactions. The latter part of the book describes optical measurement techniques and equipment. Key subspecialties include laser induced fluorescence, tunable laser absorption spectroscopy, and wavelength modulation spectroscopy. It is ideal for students and practitioners across a range of applied sciences including mechanical, aerospace, chemical, and materials engineering.