

1. Record Nr.	UNINA9910784601803321
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Titolo	Spectra of atoms and molecules [[electronic resource] /] / Peter F. Bernath
Pubbl/distr/stampa	New York, : Oxford University Press, c2005
ISBN	1-280-70444-6 0-19-534645-9
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (454 p.)
Disciplina	535.8/4
Soggetti	Atomic spectroscopy Molecular spectroscopy Spectrum analysis
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	Contents; 1 Introduction; 1.1 Waves, Particles, and Units; 1.2 The Electromagnetic Spectrum; 1.3 Interaction of Radiation with Matter; Blackbody Radiation; Einstein A and B Coefficients; Absorption and Emission of Radiation; Beer's Law; Lineshape Functions; Natural Lifetime Broadening; Pressure Broadening; Doppler Broadening; Transit-Time Broadening; Power Broadening; 2 Molecular Symmetry; 2.1 Symmetry Operations; Operator Algebra; Symmetry Operator Algebra; 2.2 Groups; Point Groups; Classes; Subgroups; 2.3 Notation for Point Groups; 3 Matrix Representation of Groups; 3.1 Vectors and Matrices Matrix Eigenvalue Problem Similarity Transformations; 3.2 Symmetry Operations and Position Vectors; Reflection; Rotation; Inversion; Rotation-Reflection; Identity; 3.3 Symmetry Operators and Basis Vectors; 3.4 Symmetry Operators and Basis Functions; Function Spaces; Gram-Schmidt Procedure; Transformation Operators; 3.5 Equivalent, Reducible, and Irreducible Representations; Equivalent Representations; Unitary Representations; Reducible and Irreducible Representations; 3.6 Great Orthogonality Theorem; Characters; 3.7 Character Tables; Mulliken Notation; 4 Quantum Mechanics and Group Theory 4.1 Matrix Representation of the Schrodinger Equation 4.2 Born-Oppenheimer Approximation; 4.3 Symmetry of the Hamiltonian

Operator; 4.4 Projection Operators; 4.5 Direct Product Representations; 4.6 Integrals and Selection Rules; 5 Atomic Spectroscopy; 5.1 Background; 5.2 Angular Momentum; 5.3 The Hydrogen Atom and One-Electron Spectra; Vector Model; Spin-Orbit Coupling; 5.4 Many-Electron Atoms; 5.5 Selection Rules; 5.6 Atomic Spectra; Hyperfine Structure; Hydrogen Atom; 5.7 Intensity of Atomic Lines; 5.8 Zeeman Effect; Paschen-Back Effect; 5.9 Stark Effect; 6 Rotational Spectroscopy 6.1 Rotation of Rigid Bodies 6.2 Diatomic and Linear Molecules; Selection Rules; Centrifugal Distortion; Vibrational Angular Momentum; 6.3 Line Intensities for Diatomic and Linear Molecules; 6.4 Symmetric Tops; Molecule and Space-Fixed Angular Momenta; Rotational Spectra; Centrifugal Distortion; Line Intensity; 6.5 Asymmetric Tops; Selection Rules; Line Intensity; 6.6 Structure Determination; 7 Vibrational Spectroscopy; 7.1 Diatomic Molecules; Wavefunctions for Harmonic and Anharmonic Oscillators; Vibrational Selection Rules for Diatomics; Dissociation Energies from Spectroscopic Data Vibration-Rotation Transitions of Diatomics Combination Differences; 7.2 Vibrational Motion of Polyatomic Molecules; Classical Mechanical Description; Quantum Mechanical Description; Internal Coordinates; Symmetry Coordinates; Symmetry of Normal Modes; Selection Rules for Vibrational Transitions; Vibration-Rotation Transitions of Linear Molecules; Nuclear Spin Statistics; Excited Vibrational States of Linear Molecules; 7.3 Vibrational Spectra of Symmetric Tops; Coriolis Interactions in Molecules; 7.4 Infrared Transitions of Spherical Tops; 7.5 Vibrational Spectra of Asymmetric Tops 7.6 Vibration-Rotation Line Intensities

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