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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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