



## CONTENTS

1. Introduction . . . . .	1
2. Theoretical Aspects of Molecular Rotation . . . . .	7
3. Microwave Transitions—Line Intensities and Shapes . . . . .	35
4. Diatomic Molecules . . . . .	73
5. Linear Polyatomic Molecules . . . . .	115
6. Symmetric-Top Molecules . . . . .	135
7. Asymmetric-Top Molecules . . . . .	161
8. Centrifugal Distortion . . . . .	205
9. Nuclear Hyperfine Structure in Molecular Rotational Spectra . . . . .	237
10. Effects of Applied Electric Fields . . . . .	303
11. Effects of Applied Magnetic Fields . . . . .	363
12. Internal Rotation . . . . .	423
13. Derivation of Molecular Structures . . . . .	495
14. Quadrupole Couplings, Dipole Moments, and the Chemical Bond . . . . .	551
Appendices	
I. Notes on Matrix Mechanical Methods . . . . .	633
II. Calculation of the Eigenvalues and Eigenvectors of a Hermitian Tridiagonal Matrix by the Continued Fraction Method . . . . .	643
III. The Van Vleck Transformation . . . . .	647
IV. Fundamental Constants and Conversion Factors . . . . .	651
V. Isotopic Abundances, Masses, and Moments . . . . .	653
VI. Covalent Bond Radii . . . . .	669
VII. Electronegativities of the Elements . . . . .	671
VIII. Molecular Structures Derived from Microwave Spectra . . . . .	675
IX. Energies and Relative Intensities of Nuclear Quadrupole Hyper- fine Structure . . . . .	711
X. Nuclear Quadrupole Second-Order Correction Energies for Linear or Symmetric-Top Molecules . . . . .	723
Author Index . . . . .	725
Subject Index . . . . .	737