

1. Record Nr.	UNINA9910145260303321
Autore	Nakamoto Kazuo <1922->
Titolo	Infrared and Raman spectra of inorganic and coordination compounds . Part A Theory and applications in inorganic chemistry [[electronic resource] /] / Kazuo Nakamoto
Pubbl/distr/stampa	Hoboken, N.J., : Wiley, c2009
ISBN	1-282-00189-2 9786612001895 0-470-40584-8 0-470-40579-1
Edizione	[6th ed.]
Descrizione fisica	1 online resource (433 p.)
Disciplina	535.842 543.57 543/.57
Soggetti	Infrared spectroscopy Raman spectroscopy Espectroscòpia infraroja Espectroscòpia Raman Llibres electrònics
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	Infrared and Raman Spectra of Inorganic and Coordination Compounds; Contents; PREFACE TO THE SIXTH EDITION; ABBREVIATIONS; Chapter 1. Theory of Normal Vibrations; 1.1. Origin of Molecular Spectra; 1.2. Origin of Infrared and Raman Spectra; 1.3. Vibration of a Diatomic Molecule; 1.4. Normal Coordinates and Normal Vibrations; 1.5. Symmetry Elements and Point Groups; 1.6. Symmetry of Normal Vibrations and Selection Rules; 1.7. Introduction to Group Theory; 1.8. The Number of Normal Vibrations for Each Species; 1.9. Internal Coordinates; 1.10. Selection Rules for Infrared and Raman Spectra 1.11. Structure Determination1.12. Principle of the GF Matrix Method; 1.13. Utilization of Symmetry Properties; 1.14. Potential Fields and Force Constants; 1.15. Solution of the Secular Equation; 1.16.

Vibrational Frequencies of Isotopic Molecules; 1.17. Metal-Isotope Spectroscopy; 1.18. Group Frequencies and Band Assignments; 1.19. Intensity of Infrared Absorption; 1.20. Depolarization of Raman Lines; 1.21. Intensity of Raman Scattering; 1.22. Principle of Resonance Raman Spectroscopy; 1.23. Resonance Raman Spectra; 1.24. Theoretical Calculation of Vibrational Frequencies  
 1.25. Vibrational Spectra in Gaseous Phase and Inert Gas Matrices  
 1.26. Matrix Cocondensation Reactions; 1.27. Symmetry in Crystals; 1.28. Vibrational Analysis of Crystals; 1.29. The Correlation Method; 1.30. Lattice Vibrations; 1.31. Polarized Spectra of Single Crystals; 1.32. Vibrational Analysis of Ceramic Superconductors; References; Chapter 2. Applications in Inorganic Chemistry; 2.1. Diatomic Molecules; 2.2. Triatomic Molecules; 2.3. Pyramidal Four-Atom Molecules; 2.4. Planar Four-Atom Molecules; 2.5. Other Four-Atom Molecules; 2.6. Tetrahedral and Square-Planar Five-Atom Molecules  
 2.7. Trigonal-Bipyramidal and Tetragonal-Pyramidal XY<sub>5</sub> and Related Molecules  
 2.8. Octahedral Molecules; 2.9. XY<sub>7</sub> and XY<sub>8</sub> Molecules; 2.10. X<sub>2</sub>Y<sub>4</sub> and X<sub>2</sub>Y<sub>6</sub> Molecules; 2.11. X<sub>2</sub>Y<sub>7</sub>, X<sub>2</sub>Y<sub>8</sub>, X<sub>2</sub>Y<sub>9</sub>, and X<sub>2</sub>Y<sub>10</sub> Molecules; 2.12. Metal Cluster Compounds; 2.13. Compounds of Boron; 2.14. Compounds of Carbon; 2.15. Compounds of Silicon, Germanium, and Other Group IVB Elements; 2.16. Compounds of Nitrogen; 2.17. Compounds of Phosphorus and Other Group VB Elements; 2.18. Compounds of Sulfur and Selenium; 2.19. Compounds of Halogen; References; Appendixes  
 I. Point Groups and Their Character Tables  
 II. Matrix Algebra; III. General Formulas for Calculating the Number of Normal Vibrations in Each Species; IV. Direct Products of Irreducible Representations; V. Number of Infrared- and Raman-Active Stretching Vibrations for MX<sub>n</sub>Y<sub>m</sub>-Type Molecules; VI. Derivation of Eq. 1.113; VII. The G and F Matrix Elements of Typical Molecules; VIII. Group Frequency Charts; IX. Correlation Tables; X. Site Symmetry for the 230 Space Groups; Index

## Sommario/riassunto

The Sixth Edition of this classic work comprises the most comprehensive and current guide to infrared and Raman spectra of inorganic, organometallic, bioinorganic, and coordination compounds. From fundamental theories of vibrational spectroscopy to applications in a variety of compound types, this has been extensively updated. New topics include the theoretical calculations of vibrational frequencies (DFT method), chemical synthesis by matrix co-condensation reactions, time-resolved Raman spectroscopy, and more. This volume is a core reference for chemists and medical professionals working with