

CONTENTS

Chapter 1	General Considerations	1
1.1	Comparison of Spectral Disciplines, 1	
1.2	The Raman Effect, 1	
1.3	Molecular Polarizability, 8	
1.4	The Resonance Raman Effect (RRE) and Pre-Resonance Raman Effect (pre- RRE), 10	
1.5	Nonlinear Raman Effects, 12	
1.6	Vibrational Spectra and Selection Rules, 12	
1.7	"Mutual Exclusion Rule," 17	
1.8	Group Frequencies, 22	
1.9	Depolarization Ratios, 26	
1.10	Raman Scattering From Optically Active Molecules (Circular Differential Raman Spectra), 31	
	References, 35	
Chapter 2	Instrumentation and Sample Handling	38
2.1	Instrumentation, 38	
2.2	Fluorescence and Its Reduction, 44	
2.3	Colored Samples, 48	
2.4	Sample Handling Techniques, 50	
	References, 66	
Chapter 3	Amines, Alkynes, and Nitriles	68

3.1	Amines, 68	
3.2	Alkynes, 70	
3.3	Nitriles, 73	
	References, 76	
Chapter 4	Carbonyls	77
4.1	Introduction, 77	
4.2	Depolarization Values, 79	
4.3	Summary, 105	
4.4	Intensity Ratios of α -Unsaturated Carbonyls, 105	
	References, 110	
Chapter 5	Ethylenic Double Bonds	111
5.1	Introduction, 111	
5.2	Band Locations, 111	
5.3	Band Intensities and Band Intensity Ratios, 116	
5.4	Conjugated Acyclic Dienes, 125	
5.5	Conjugated Cyclodienes, 130	
5.6	Quantitative Analysis, 132	
	References, 137	
Chapter 6	Ring Systems	139
6.1	Alicyclics, 139	
6.2	Aromatics, 174	
	References, 188	
Chapter 7	The Ethylene Methyl Group	191
	References, 201	
Chapter 8	Acyclic and Alicyclic Sulfur- Containing Compounds	202
8.1	Introduction, 202	
8.2	Thiols, 203	
8.3	Sulfides, 203	
8.4	Disulfides, 218	
8.5	Trisulfides, 236	
8.6	Acyclic Polysulfides, 238	
8.7	Vulcanized Rubbers, 238	
8.8	Thioacetates, 240	
	References, 241	

Chapter 9	Synthetic Polymers	243
9.1	Introduction, 243	
9.2	Quantitative Aspects, 244	
9.3	Stereoregularity, 245	
9.4	Chain Conformation in the Solid State, 250	
9.5	Chain Conformation in Solution, 255	
	References, 256	
Chapter 10	Biological Materials	258
10.1	Introduction, 258	
10.2	Amino Acids, 259	
10.3	Biopolymer Conformations, 259	
10.4	Amide I and Amide II Bands of Polypeptides, 260	
10.5	The Amide III Band, 267	
10.6	Proteins, 269	
10.7	Carotenoids, 284	
10.8	Chlorophylls, 285	
10.9	Nucleic Acids and Polynucleotides, 286	
10.10	Lipids, 295	
10.11	Vitamins, 302	
	References, 302	
Chapter 11	Remote Raman Spectroscopy in Pollution Studies	307
11.1	Introduction, 307	
11.2	Detection and Measurement of Air Pollutants, 307	
11.3	Detection and Determination of Water Pollutants, 316	
	References, 319	
Subject Index		321
Wiswesser Line Notation Index		327