

CONTENTS

1	Introduction	1	
2	Mass Spectrometry	5	
	I. Introduction	5	
	II. Instrumentation	6	
	III. The Mass Spectrum	11	
	IV. Determination of a Molecular Formula	12	
	V. Recognition of a Molecular Ion (Parent Peak)	14	
	VI. Use of the Molecular Formula	16	
	VII. Fragmentation	16	
	VIII. Rearrangements	18	
	IX. Derivatives	18	
	X. Mass Spectra of Some Chemical Classes	19	
3	Infrared Spectrometry	73	
	I. Introduction	73	
	II. Theory	74	
	III. Instrumentation	78	
	IV. Sample Handling	80	
	V. Interpretation of Spectra	82	
	VI. Characteristic Group Frequencies of Organic Molecules	83	
4	Magnetic Resonance Spectrometry	159	
	I. Introduction and Theory	159	
	II. Apparatus and Sample Handling	162	
	III. Chemical Shift	164	
	IV. Simple Spin-Spin Coupling	169	
	V. Protons on Heteroatoms	174	
	VI. Coupling of Protons to Other Nuclei	179	
	VII. More Complex Spin-Spin Coupling	181	
	VIII. Virtual Coupling and Deceptively Simple Spectra	187	
	IX. Effects of an Asymmetric Center	189	
	X. Vicinal and Geminal Coupling in Rigid Systems	190	
	XI. Long-Range Coupling	191	
	XII. Spin-Spin Decoupling	192	
	XIII. Shift Reagents	194	
	XIV. Carbon 13 NMR	196	
5	Ultraviolet Spectrometry	231	
	I. Introduction	231	
	II. Theory	232	
	III. Instrumentation	236	
	IV. Sample Handling	238	
	V. Characteristic Absorption of Organic Compounds	238	
6	Sets of Spectra Translated into Compounds	259	
7	Sets of Spectra with Beilstein References	315	
	Index	335	