



## TABLE OF CONTENTS

PREFACE . . . . .		v
INTRODUCTION . . . . .		ix
Chapter I:	<b>RADIANT ENERGY SOURCES . . . . .</b>	<b>1</b>
	1. Properties of sources . . . . .	1
	2. The continuum and the line spectrum of molecular hydrogen . . . . .	2
	3. The Lyman continuum . . . . .	8
	4. The inert gas continua . . . . .	13
	5. Synchrotron radiation . . . . .	20
	6. Continuous-operation sources of line spectra . . . . .	24
	7. Line emission of pulsed sources . . . . .	31
	8. Hot plasma sources . . . . .	41
Chapter II:	<b>OPTICAL MATERIALS . . . . .</b>	<b>47</b>
	9. Transparent materials . . . . .	47
	10. Transparent films . . . . .	53
	11. Reflecting layers . . . . .	60
Chapter III:	<b>SPECTRAL INSTRUMENTS . . . . .</b>	<b>88</b>
	12. General information . . . . .	88
	13. Concave reflection grating . . . . .	90
	14. Separation of overlapping spectra of successive orders . . . . .	97
	15. Grating mountings . . . . .	99
	16. The magnification of a special instrument . . . . .	105
	17. Types of spectral instruments . . . . .	106
	18. Rocket-borne instruments . . . . .	127
	19. Interference instruments . . . . .	139
	20. Polarization instruments . . . . .	141
	21. Some aspects of experimental technique . . . . .	144
Chapter IV:	<b>DÉTECTORS FOR THE VACUUM ULTRAVIOLET . . . . .</b>	<b>156</b>
	22. Thermocouples . . . . .	156
	23. Photoelectric detectors . . . . .	157
	24. Thermophosphors . . . . .	165
	25. Photographic emulsion and other photochemical detectors . . . . .	167
	26. Ionization detectors . . . . .	169
	27. Filtering detectors . . . . .	172

Chapter V:	WAVELENGTH MEASUREMENT . . . . .	181
	28. Line identification . . . . .	181
	29. Wavelength standards . . . . .	184
	30. Lamb shift measurement . . . . .	188
Chapter VI:	ENERGY MEASUREMENTS IN THE VACUUM ULTRAVIOLET . . . . .	216
	31. Methods of measurement of absolute and relative intensities . . . . .	216
	32. Homochromatic photometry . . . . .	218
	33. Determination of system efficiency with standard sources . . . . .	220
	34. Determination of transmission of the spectral instrument . . . . .	226
Chapter VII:	ABSORPTION SPECTRA IN THE VACUUM ULTRAVIOLET . . . . .	231
	35. Experimental determination of the absorption coefficient and the absorption cross section of a gas . . . . .	231
	36. Autoionization and term perturbation . . . . .	235
	37. Absorption spectra of metal vapors . . . . .	239
	38. Absorption spectra of inert gases . . . . .	254
	39. Absorption spectra of molecular and atomic gases . . . . .	273
Chapter VIII:	DETERMINATION OF ATOMIC CONSTANTS FROM MEASUREMENTS IN THE VACUUM ULTRAVIOLET . . . . .	305
	40. Measurement of oscillator strengths of lines in the vacuum ultraviolet . . . . .	305
	41. Verification of the sum rule for the atoms of inert gas . . . . .	316
	42. Refractive indices of gases and Rayleigh scattering cross sections . . . . .	318
	43. Measurement of excitation cross sections in the vacuum ultraviolet . . . . .	324
Chapter IX:	PLASMA DIAGNOSTICS . . . . .	330
	44. Determination of the electron temperature of a plasma . . . . .	330
	45. Line shapes . . . . .	337
	46. Impurity emissions in hot-plasma machines . . . . .	341
	47. Plasma probing with short-wave ultraviolet radiation . . . . .	345
Chapter X:	THE SHORT-WAVE RADIATION OF THE SUN . . . . .	351
	48. The solar spectrum . . . . .	351
	49. Hydrogen lines in the solar spectrum and photographs of the sun in $L_{\alpha}$ light . . . . .	361
	50. Identification of coronal lines . . . . .	364
Chapter XI:	SPECTROSCOPIC ANALYSIS IN THE VACUUM ULTRAVIOLET . . . . .	370
	51. Specific features of spectroscopic analysis in the vacuum ultraviolet . . . . .	370
	52. Emission analysis . . . . .	372
	53. Absorption analysis . . . . .	377
	SUBJECT INDEX . . . . .	381

