CONTENTS

Pre	eface	vii
Fut	ture Contributions	ix
Foi	reword	xiii
Со	ontributors	XV
1.	Early History of Wien Filters	1
	1. Wilhelm Wien and his Wien Filter	. 1
	2. Up to 1950s: Applications to a Part of Mass Analyzers	2
	3. After the 1960s: The First Application to Electrons	3
	4. A Brief History of the Theory of Wien Filters	4
	5. About This Book	6
2.	Aberration Theory of the Wien Filter	7
	1. Preliminary Remarks	8
	2. Zeroth-order Wien Filter	14
	3. Stigmatic Wien Filters	42
	4. Homogeneous Fields Wien Filters	73
	5. First-Order Wien Filters	87
	6. Relativistic Charged Particle Paths in Wien Filters	92
3.	Wien Filter Instrumentation	105
	1. Iron-free Coils	108
	2. Generation of Quadrupole Fields	116
	3. Double-Focus Wien Filter	123
	4. Comments on the Wien Condition	124
	5. Effect of Retarding Field	125
4.	Simulation of Multipole Wien Filters	127
	1. Multipole Wien Filters	128
	2. Previous Simulation Work on Multipole Wien Filters	131
	3. Estimation of Voltages and Ampere-Turns	132
	4. Simulation of an Equal-Arch, 8-Pole Wien Filter	134
	5. Simulation of Equal-Arch, 12-Pole Wien Filter	140
	6. Simulation of Different-Arch, 8-pole Wien Filter	143
	7. A Different-Arch, 12-pole Wien filter	147

vi Contents

5.	Wie	n Filter Applications to lons	151
	1.	Wien Filters as Independent Mass Analyzers	152
	2.	Double-Focusing Mass Spectrometers	155
	3.	Wien Filter in Accelerator Mass Spectrometry	165
	4.	Micro Wien Filters as Leak Detectors	165
	5.	Wien Filters for Radioactive Ions	165
	6.	Reaction Product Separators	166
	7.	Multiple Wien Filters	175
6.	Application of Wien Filters to Electrons		177
	1.	Monochromators and Analyzers	178
	2.	Beam Separator	183
	3.	Wien Spin Rotator	194
	4.	Wien Electron Phase Shifter	199
	5.	Wien Aberration Corrector	200
	6.	Wien Filter Without Dipoles	210
Ret	ferenc	213	
Index			221
Contents of Volumes 151–175			233