

CONTENTS

<i>Preface</i>	vii	
CHAPTER I	EVAPORATION	
	Introduction	1
	Oxidation	4
	Evaporative Coating	6
	Atoms and Molecules	7
	Diameters of Molecules	9
	Distances between Molecules in the Gaseous State	11
	Velocities of Gas Molecules	17
	Evaporation in a Vacuum	19
CHAPTER II	VACUUM TECHNOLOGY	
	Mechanical Vacuum Pump	24
	Pumping Speed of a Mechanical Pump	25
	Pressure Measurement	28
	Thermocouple Vacuum Gauge	30
	Impacts of Gas Molecules against Solid Surfaces in a Vacuum Chamber	32

Diffusion Pump	36
Ionization Gauge	40
Pumping Limits, Baffles, and Cold Traps	42
A Vacuum System	44
Vacuum Chamber and Feedthroughs	46
Pumping Limits Due to Outgassing	50
Meissner Traps	54
Leak Detecting	57
Maintenance of Vacuum Pumps	60
Other Vacuum Pumps and Gauges	62
CHAPTER III VACUUM EVAPORATION	
Vapor Pressure	65
Evaporation Temperature and Pressure	66
Vacuum Evaporation Sources	75
Electron-Beam Sources	81
Evaporation of Alloys and Compounds	83
Film Thickness Measurement and Control	83
Substrate Cleaning	87
CHAPTER IV SPUTTERING	
Ion Bombardment of a Surface	92
Glow Discharge	96
The Langmuir Probe	105
The Triode Sputtering System	108
Radio-Frequency Sputtering	123
Unique Characteristics of Sputtering	130
Ion Plating	131
CHAPTER V THIN FILMS	
Photolithography	138
General Applications	140
Specific Applications	143
 <i>Index</i>	 149