

CONTENTS

Contributors	v
Preface	vii

I. Polycrystalline Carbon and Graphite

J. M. HUTCHEON

I Introduction	2
II Soft Carbons	6
III Hard Carbons	33
IV Carbon Blacks	37
V Unorganized Carbon	39
VI Hetero-atoms	40
VII Summary	42
References	44

II. Manufacturing Technology of Baked and Graphitized Carbon Bodies

J. M. HUTCHEON

I Introduction	49
II Conventional Process	50
III Polymer Carbons	59
IV Pyrolytic Carbon and Graphite	61
V Control of Technical Properties	61
VI Conclusion	74
References	75

III. Electron Transport in Graphites and Carbons

G. A. SAUNDERS

I Introduction	79
II The Band Structure of Graphite	81
III a-Axis Electron Transport Properties in Graphites	98
IV Electron Transport Along the c-Axis	114
V Graphite as a Solid State Plasma	118
VI Electrical Properties of Graphite Compounds	120
References	125

IV. Thermal Gas Reactions of Graphite

J. B. LEWIS

I	Introduction	129
II	Crystallographic and Physical Structure of Carbon	130
III	Thermal Gas Reactions at Temperatures Below 1000°C	134
IV	Reactions at High Temperatures	174
V	Reactions with Atomic Gases	178
VI	Physical Factors Controlling Gasification Rates	184
	References	190

V. Mechanical Properties

H. H. W. LOSTY

I	Elastic Properties	202
II	Thermal Creep	212
III	Strength	214
	References	220

VI. Friction and Wear

D. V. BADAMI AND P. K. C. WIGGS

I	Introduction	224
II	Manufacture of Commercial Carbons	225
III	The Applications of Carbon	228
IV	The Structure of Carbon	233
V	Friction Between Carbon and Counterface	238
VI	The Wear Process	248
VII	The Effect of Atmosphere on Friction and Wear	252
VIII	Summary	253
	References	254

VII. Industrial Applications of Carbon and Graphite

A. R. FORD AND E. GREENHALGH

I	Introduction	258
II	Metallurgical Applications	261
III	Chemical Applications	272
IV	Thermal Applications	282
V	Miscellaneous	287
	References	291
	AUTHOR INDEX	293
	SUBJECT INDEX	305