



CONTENTS

PREFATORY CHAPTER

- A Commentary on the Emergence and Evolution of "Materials Science,"
David Turnbull 1

EXPERIMENTAL AND THEORETICAL METHODS

- The Use of Infrared Methods to Study Polymer Interfaces, *S. R. Culler,
H. Ishida, and J. L. Koenig* 363

PREPARATION, PROCESSING, AND STRUCTURAL CHANGES

- A Quarter of a Century of Plasma Spraying, *J. H. Zaat* 9
Plasma-Assisted Etching in Microfabrication, *J. W. Coburn and Harold
F. Winters* 91
Photoinitiated Cationic Polymerization, *J. V. Crivello* 173
Mechanical Alloying, *P. S. Gilman and J. S. Benjamin* 279
Ultrafine Filamentary Composites, *J. Bevk* 319
Material Processing with Broad-Beam Ion Sources, *J. M. E. Harper,
J. J. Cuomo, and H. R. Kaufman* 413

PROPERTIES AND PHENOMENA

- Solitions in Solids, *Tarik Ö. Ogurtani* 67
Trapping of Interstitials in Metals, *Charles A. Wert and Robert C. Frank* 139
Light Scattering from Bulk Polymers, *G. D. Patterson* 219
Materials Processing in the Reduced-Gravity Environment of Space,
John R. Carruthers and Louis R. Testardi 247
The Erosion of Metals, *P. Shewmon and G. Sundararajan* 301
Ion Mixing, *S. Matteson and M-A. Nicolet* 339
Bulk and Interface Thermodynamics of Polymer Alloys, *Isaac C.
Sanchez* 387

SPECIAL MATERIALS

- Reinforced Thermoplastics: Through Flow to Use, *C. E. Chaffey* 43
Transition Metal Silicides, *S. P. Murarka* 117
Ceramic Materials for the Immobilization of Nuclear Waste, *D. R.
Clarke* 191

INDEXES

- Subject Index 441
Cumulative Index of Contributing Authors, Volumes 9–13 450
Cumulative Index of Chapter Titles, Volumes 9–13 452