

CONTENTS

INTRODUCTION

1. Fundamental Limits of Lithography	5
2. Practical and Fundamental Aspects of Lithography	11
3. A Perspective on Resist Materials for Fine-Line Lithography	39

FUNDAMENTAL RADIATION CHEMISTRY

4. Fundamental Aspects of Polymer Degradation by High-Energy Radiation	125
5. Pulse Radiolysis Studies on the Mechanism of the High Sensitivity of Chloromethylated Polystyrene as an Electron Negative Resist	151
6. Photochemistry of Ketone Polymers in the Solid Phase: A Review	165
7. Radiolysis of Poly(isopropenyl <i>t</i> -butyl ketone)	179
8. Polymer-Bonded Electron-Transfer Sensitizers	187
9. Laser-Induced Polymerization	207
10. Novel Synthesis and Photochemical Reaction of the Polymers with Pendant Photosensitive and Photosensitizer Groups	225
11. A Novel Technique for Determining Radiation Chemical Yields of Negative Electron-Beam Resists	241
12. Anomalous Topochemical Photoreaction of Olefin Crystals	255

RESIST MATERIALS AND APPLICATIONS

13. The Photo-Fries Rearrangement and Its Use in Polymeric Imaging Systems	269
14. Soluble Polysilane Derivatives: Interesting New Radiation-Sensitive Polymers	293
15. Preparation and Resolution Characteristics of a Novel Silicone-Based Negative Resist	311
16. Positive-Working Electron-Beam Resists Based on Maleic Anhydride Copolymers	323
17. Functionally Substituted Novolak Resins: Lithographic Applications, Radiation Chemistry, and Photooxidation	339
18. Synthesis, Characterization, and Lithographic Evaluation of Chlorinated Polymethylstyrene	361
19. Photochemistry of Ketone Polymers in the Solid Phase: Thin Film Studies of Vinyl Ketone Polymers	389
20. Polymers of α -Substituted Benzyl Methacrylates and Aliphatic Aldehydes as New Types of Electron-Beam Resists	399
21. Radiation Chemistry of Phenolic Resin Containing Epoxy and Azide Compounds	423
22. Organic Direct Optical Recording Media	435
23. Primary and Secondary Reactions in Photoinitiated Free-Radical Polymerization of Organic Coatings	457
24. Radiation Stability of Silicon Elastomers	473
Author Index	481
Subject Index	481