

CONTENTS

Preface	xi
1. Materials Failure and Materials Research Policy	1
John D. Hoffman	
2. Physical Factors in Polymer Degradation and Stabilization	11
F. H. Winslow	
3. Polymer Film Photodegradation: Optical Density Effects	29
Allan R. Shultz	
4. The Course of Thermooxidative Degradation of LD- and HD-Polyethylene under Accelerated Testing Conditions	45
Arne Holmström	
5. Long-Term Photo- and Thermal Oxidation of Polyethylene	63
H. M. Gilroy	
6. Fourier Transform IR Studies of the Uninhibited Autoxidation of Elastomers	75
J. R. Shelton, R. L. Pecsok, and J. L. Koenig	
7. Application of New Kinetic Techniques to the Lifetime Prediction of Polymers from Weight-Loss Data	97
Joseph H. Flynn and Brian Dickens	
8. The Use of Chemiluminescence in the Study of Paper Permanence .	117
G. B. Kelly, J. C. Williams, G. D. Mendenhall, and C. A. Ogle	
9. Degradation of Chlorinated Polyethylene: Effect of Cross-Linking on Dehydrochlorination	127
Ismat A. Abu-Isa	
10. Crystallinity in Hydrolytically Aged Polyester Polyurethane Elastomers	145
D. W. Brown, R. E. Lowry, and L. E. Smith	
11. Effect of Hydrolytic Degradation on Compression-Deflection Characteristics and Hardness of Structured Polyurethane Castings .	155
M. A. Mendelsohn and G. B. Rosenblatt	
12. Equilibrium Distribution of a Minor Constituent between a Polymer and Its Environment	171
Isaac C. Sanchez	
13. Polyphenylene Sulfide: Stability and Long-Term Behavior	183
H. Wayne Hill, Jr.	

14. Review of Experimental Investigations of Molecular Phenomena Associated with Fracture in Polymers	199
K. L. DeVries, Douglas Gustaveson, and Redd Smith	
15. The Application of Chemiluminescence for the Study of Polymer Mechanochemistry	211
D. L. Fanter and R. L. Levy	
16. Time-Cross-Link Density Reduction for Use in Long Time Behavior Prediction	219
C. Ying-Cheung Lee and J. J. Aklonis	
17. The Influence of Vacuole Formation and Growth on the Mechanical Behavior of Polymers	233
R. J. Farris, R. Falabella, and Y. D. Tsai	
18. Physical Aging of Glassy Polymers: Effects of Subsidiary Relaxation Processes	245
A. S. Marshall and S. E. B. Petrie	
19. Creep Failure of Rubbery Polymers	261
Sueo Kawabata	
20. Lifetime Behavior of Polyethylene Bars in Uniaxial Extension in Various Chemical Environments	289
J. M. Crissman and L. J. Zapas	
21. Stress-Strain-Time Diagrams, Including Failure Envelopes, for High-Density Polyethylenes of Different Molecular Weight	301
L. J. Zapas and J. M. Crissman	
22. Fatigue Crack Propagation in PVC: Combined Effects of Rubbery Inclusions and Molecular Weight	311
M. D. Skibo, J. A. Manson, S. M. Weblar, R. W. Hertzberg, and E. A. Collins	
23. Fatigue Effects in Poly(Methyl Methacrylate)	331
R. W. Penn and G. B. McKenna	
24. The Effects of Temperature and Moisture on the Accelerated Aging of Paper	341
E. L. Graminski, E. J. Parks, and E. E. Toth	
25. Reinforcing Degraded Textiles: Effect of Deacidification on Fabric Deterioration	357
N. Kerr, S. P. Hersh, P. A. Tucker, and G. M. Berry	
26. Factors Affecting Adhesion of Lithographic Materials	371
K. L. Mittal	
27. Durability of the Bond between Mineralized Tissues and Potential Adhesives	393
G. M. Brauer, D. J. Termini, and J. A. Jackson	
28. Surface Degradation of E-Glass and S-Glass in the Presence of Water	411
Andrew C. T. Hsu and James R. Schafner	
29. Molecular Weight Distribution Studies of Electrically Stressed Polyethylene	421
John A. Crowther, Julian F. Johnson, and John Tanaka	

30. Aging of Polyolefin Electrical Insulation 433
K. D. Kiss, H. C. Doepken, Jr., N. Srinivas, and B. S. Bernstein

31. Concluding Remarks 467
F. E. Bailey, Jr.

Index 469