

CONTENTS

GENERAL SOLAR APPLICATIONS

1. Polymers in Solar Energy: Applications and Opportunities	3
2. Economics of Solar Heating Systems	19
3. Polymer Film and Laminate Technology for Low-cost Solar Energy Collectors	27
4. Stability of Polymeric Materials in the Solar Collector Environment	39
5. The Reduction of Solar Light Transmittance in Thermal Solar Collectors as a Function of Polymer Outgassing	81
6. Optical, Mechanical, and Environmental Testing of Solar Collector Plastic Films	99
7. Protective Coatings and Sealants for Solar Applications	115
8. Reactivity of Polymers with Mirror Materials	125
9. Effect of Absorber Concentrations on IR Reflection-Absorbance of Polymer Films on Metallic Substrates	143
10. Adhesives Used in Reflector Modules of Troughs: Effects of Environmental Stress	169
11. Salt-Gradient Solar Ponds and Their Liner Requirements	187
12. Flexible Membrane Linings for Salt-Gradient Solar Ponds	195
13. Plastic Pipe Requirements for Ground-Coupled Heat Pumps	211

POLYMER PHOTODEGRADATION IN SOLAR APPLICATIONS

14. New Approach to the Prediction of Photooxidation of Plastics in Solar Applications	217
15. Effects of Photodegradation on the Sorption and Transport of Water in Polymers	231
16. UV Microscopy of Morphology and Oxidation in Polymers	243
17. Novel Diagnostic Techniques for Early Detection of Photooxidation in Polymers	265
18. Photodegradation of Poly(n-butyl acrylate)	275
19. Photochemical Stability of UV-Screening Transparent Acrylic Copolymers of 2-(2-Hydroxy-5-vinylphenyl)-2H-benzotriazole	293
20. Effects of Deformation on the Photodegradation of Low-Density Polyethylene Films	307

PHOTOVOLTAIC AND RELATED APPLICATIONS

21. Luminescent Solar Concentrators: An Overview	331
22. Polymeric Encapsulation Materials for Low-Cost, Terrestrial, Photovoltaic Modules	353
23. Encapsulant Material Requirements for Photovoltaic Modules	367
24. Encapsulant Degradation in Photovoltaic Modules	387
25. Vacuum Lamination of Photovoltaic Modules	407
26. Evaluation of Polyacrylonitrile as a Potential Organic Polymer Photovoltaic Material	421
27. Photovoltaic Properties of Organic Photoactive Particle Dispersions: Polymeric Phthalocyanines	437

28. Photophysics of Films of Poly(2-vinylnaphthalene) Doped with Pyrene and 1,2,4,5-Tetracyanobenzene	457
29. Photoelectrochemical Catalysis with Polymer Electrodes	473
Index	495