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| Nota di contenuto       | Cover; Contents; List of Contributors; List of Abbreviations and Symbols; Preface; Chapter 1 Biodegradable Polyesters: Synthesis, Properties, Applications; 1.1 Historical Overview on the Origin of Polymer Science and Synthesis of Polyamides and Polyesters; 1.1.1 Synthesis of Polyamides; 1.1.2 Initial Knowledge about Polyesters; 1.2 Publication Trend of Representative Biodegradable and Nonbiodegradable Polyesters in the Past Century; 1.3 Biodegradable Polyesters; 1.3.1 Biodegradable Aliphatic Polyesters and Their Copolymers; 1.3.1.1 Poly(lactic acid)<br>1.3.1.2 Polyglycolide or Poly(glycolic acid)1.3.1.3 Poly(caprolactone); 1.4 Concluding Remarks; Acknowledgment; References; Chapter 2 Functional (Bio)degradable Polyesters by Radical Ring-Opening Polymerization; 2.1 Introduction; 2.2 Radical Ring-Opening Polymerization (RROP) of Cyclic Ketene Acetals; 2.2.1 Starting Monomers: Cyclic Ketene Acetals; 2.2.2 Radical Ring-Opening Polymerization Mechanism; 2.2.3 Functional Polyesters by Conventional and Controlled Radical Homopolymerization of CKAs; 2.2.4 Functional Polyesters by Copolymerization of CKAs and Vinyl Monomers; 2.3 |

## Conclusions

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3.8.2 In Material Industry: PHAs as Polymeric Materials 3.8.2.1 PHAs as Biodegradable Plastics and Fiber Materials; 3.8.2.2 PHAs as Medical Implant Materials; 3.8.2.3 PHAs as Drug Delivery Carrier; 3.8.3 Fine Chemical Industry: PHA Chiral Monomers; 3.8.4 Application of PHA Granule Surface Proteins; 3.8.5 Production of Tailor-Made Biopolyester Nanoparticles and Potential Applications; 3.8.6 Future Development of PHA-Based Industry; 3.8.6.1 The Development of Low-Cost PHA Production Technology; 3.8.6.2 Unusual PHAs with Special Properties; 3.8.6.3 High Value Added Applications  
3.8.6.4 Other Future Applications 3.8.6.5 Microbial Synthesis of Poly (lactic acid) (PLA); 3.8.7 Applications of PHA Inclusions as Functionalized Biobeads; 3.8.7.1 Bioseparations; 3.8.7.2 Drug Delivery; 3.8.7.3 Protein Purification; 3.8.7.4 Enzyme Immobilization; 3.8.7.5 Diagnostics and Imaging; 3.8.7.6 Vaccine Delivery; 3.9 Conclusions and Outlook; Acknowledgments; References; Chapter 4 Synthesis, Properties, and Mathematical Modeling of Biodegradable Aliphatic Polyesters Based on 1,3-Propanediol and Dicarboxylic Acids; 4.1 Introduction; 4.1.1 Aliphatic Polyesters  
4.1.2 Production of 1,3-Propanediol

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### Sommario/riassunto

Collating otherwise hard-to-get and recently acquired knowledge in one work, this is a comprehensive reference on the synthesis, properties, characterization, and applications of this eco-friendly class of plastics. A group of internationally renowned researchers offer their first-hand experience and knowledge, dealing exclusively with those biodegradable polyesters that have become increasingly important over the past two decades due to environmental concerns on the one hand and newly-devised applications in the biomedical field on the other. The result is an unparalleled overview for the

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