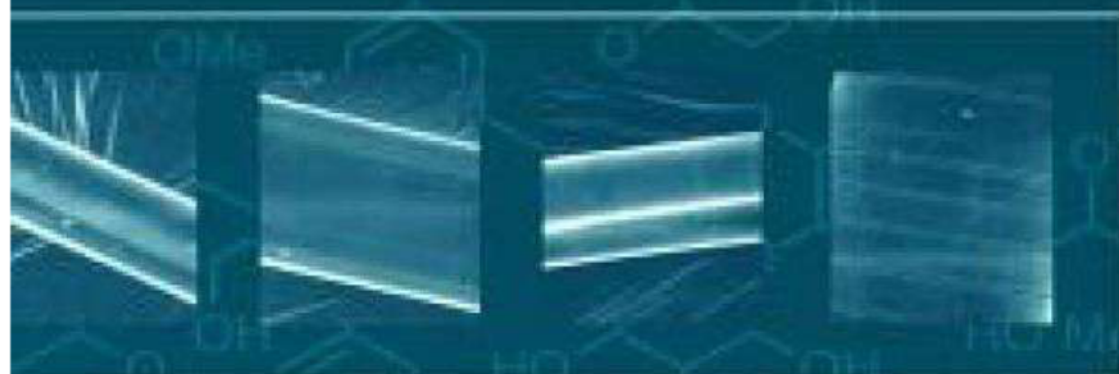


BIODEGRADABLE POLYMERS AND PLASTICS



Edited by
EMO CHIELLINI
and
ROBERTO SOLARO

Biodegradable Polymers and Plastics

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Preface

Synthetic and semi-synthetic polymeric materials were originally developed for their durability and resistance to all forms of degradation including biodegradation. Special performance characteristics are achieved in items derived therefrom through the control and maintenance of their molecular weight and functionality during the processing and under service conditions. Polymeric materials were and are currently widely accepted because of their ease of processability and amenability to provide a large variety of cost effective items that help enhancing the comfort and quality of life in the modern industrial society.

The widespread utilization of plastics in various mercantile segments that make the polymeric materials so convenient and useful to the human life, has contributed however to create a serious plastic waste burden, sometimes unfairly oversized by media because of the visible dispersion of plastic litter in the environment and the heavy contribution to landfill depletion due to the unfavorable weight to volume ratio of plastic items.

On the other hand, the expectations in the 21st century for polymeric material demand are in favor of 2 to 3 fold production increase in the next couple of decades, thus overcoming the world-wide annual production of paper as a consequence of the increase of plastic consumption in developing countries and countries in transition. Indeed, the magnitude of the indicated jump of plastic consumption with respect to the present annual level of 2-15 kg pro-capita can be easily envisaged for those countries once they will approach the living standards of industrialized countries with an annual average consumption pro-capita of 100 kg.

The design, production and consumption of polymeric materials for commodity and specialty plastic items have certainly to face all the constraints and regulations already in place or to be issued in the near future, dealing with the management of primary and post-consume plastic waste. Therefore, the formulation of environmentally sound degradable polymeric materials and relevant plastic items will constitute a key option among those available for the management of plastic waste.

In this connection the 7th World Conference on “Biodegradable Polymers & Plastics” held in Tirrenia (Pisa) - Italy in June 2002, as renamed continuation of the series of six former International Scientific Workshops on Biodegradable Polymers and Plastics started in 1989, was focused on the following topics and issues comprising:

- ◆ Environmentally Degradable Polymeric Materials (EDPs)
- ◆ Water-soluble/Swellable Biodegradable Polymers
- ◆ EDPs from Renewable Resources
- ◆ Biopolymers
- ◆ Bioresorbable Materials for Biomedical Applications
- ◆ Biorelated Polymers
- ◆ Standards and Regulations on EDPs.

The building of a common understanding background for a more rational utilization of resources in the fabrication and consumption of plastic items and in approaching issues bound to plastic waste management, constitute one of the major goal of the Conference. In order to avoid misuse of some fundamental concepts and for a fair appreciation of EDPs, it is useful to provide some general definitions that has been amply debated and basically accepted on a ground of common consensus.

Fundamental concepts and provision of general guidelines aimed at meeting the sustainability criteria of the modern industrial development constitute a focal point of the Conference. Polymeric materials and plastics deriving from fossil and renewable feedstocks, meeting the environmental degradability and biodegradability criteria, were considered in relation to their specific segments of applications including commodity and specialty areas.

The present book comprises some of the major contributions given at the Conference. For convenience they have been grouped in four sections even though they have a common backbone encompassing the synthesis and characterization of polymeric materials meant to be qualified as environmentally compatible and degradable with ultimate propensity to biodegradation.

The Editors
Emo Chiellini and Roberto Solaro

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