1. Record Nr. UNINA9910813189403321

Autore	Makuuchi Keizou
Titolo	Radiation processing of polymer materials and its industrial applications / / Keizou Makuuchi, Song Cheng
Pubbl/distr/stampa	Hoboken, N.J., : Wiley, 2011
ISBN	1-283-40120-7 9786613401205 1-118-16280-3 1-118-16279-X 1-118-16285-4
Edizione	[1st ed.]
Descrizione fisica	1 online resource (445 p.)
Altri autori (Persone)	ChengSong
Disciplina	620.1/9204228
Soggetti	Polymers - Effect of radiation on Radiation chemistry - Industrial applications
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Radiation Processing of Polymer Materials and its Industrial Applications; Contents; Preface; Abbreviations; 1: Basic Concepts of Radiation Processing; 1.1: Radiation Sources; 1.1.1: ?- Ray; 1.1.2: Electron Beam; 1.1.3: X-Ray; 1.2: Radiation Chemistry of Polymers; 1.2.1: Interactions of Ionizing Radiation with Polymers and Reactions Induced; 1.2.2: Different Responses to Radiation from Different Polymers; 1.3: Advantages and Disadvantages of Radiation Processing; 1.4: Engineering of Radiation Processing; 1.4.1: Materials Handling; 1.4.2: Radiation Dose and Dose Distribution; 1.4.3: Throughput 1.4.4: Temperature Rise1.4.5: Atmosphere; 1.4.6: Dose Rate; 1.4.7: Radiation Processing Cost; References; 2: Fundamentals of Radiation Crosslinking; 2.1: Radiation Chemistry of Crosslinking; 2.1.1: Types of Crosslinking; 2.1.2: Evidence of Crosslinking; 2.2: Crosslinking of Polymer; 2.2.1: Crosslinking of Semicrystalline Polymer; 2.2.1.1: Peroxide Crosslinking; 2.2.1.2: Silane Crosslinking; 2.2.1.3: Technical Comparison of Crosslinking Methods; 2.2.2: Crosslinking of Rubber; 2.2.2.1: Radiation Crosslinking Versus Sulfur Crosslinking 2.2.2.2: Radiation Crosslinking Versus Peroxide Crosslinking2.3:

Estimation of G Value of Crosslinking; 2.3.1: Charlesby-Pinner Method; 2.3.2: Modification of Charlesby-Pinner Equation; 2.3.3: Swelling and Elasticity Methods; 2.4: Factors Affecting Radiation Crosslinking; 2.4.1: Physical Nature of Polymer; 2.4.1.1: Glass-Transition Temperature; 2.4.1.2: Crystallinity; 2.4.2: Chemical Composition of Polymer; 2.4.2.1: Bond Energy; 2.4.2.2: Unsaturation; 2.4.2.3: Methyl Group; 2.4.2.4: Halogen Atom; 2.4.2.5: Phenyl Group; 2.4.2.6: Ester and Ether Bond; 2.4.2.7: Copolymer
2.4.2.8: Ethylene Copolymer2.4.2.9: Fluoropolymer; 2.4.2.10: Silicone Rubber; 2.4.2.11: Branching; 2.4.3: Molecular Weight and Molecular Weight Distribution; 2.4.4: Configuration; 2.4.4.1: Structural Isomerism; 2.4.4.2: Stereoisomerism; References; 3: Enhancement of Radiation Crosslinking; 3.1: Concept of Enhancement of Radiation Crosslinking; 3.2: Increasing Number of Polymer Radicals; 3.2.1: Sensitizer; 3.2.2: Postirradiation Heat Treatment; 3.3: Increasing Recombination of Polymer Radicals; 3.3.1: Compression; 3.3.2: High-Temperature Irradiation; 3.3.3: Plasticizer
3.3.4: Polyfunctional Monomer3.4: Filler Effect; 3.4.1: Modification of Superstructure; 3.4.2: Direct Bonding to Amorphous Polymers; 3.5: Hybrid Crosslinking; 3.6: Selection of Antioxidant; 3.7: Advanced Radiation Crosslinking; References; 4: Properties of Radiation Crosslinked Polymers; 4.1: Radiation Crosslinked Rubbers; 4.1.1: Radiation Crosslinking of Rubbers; 4.1.2: Properties of Radiation Crosslinked Rubbers with PFM; 4.1.3: Silicone Rubber; 4.1.4: Fluoroelastomer; 4.2: Radiation Crosslinked Plastics; 4.2.1: Physical Properties of Crosslinked Polymers at Room Temperature
4.2.1.1: Mechanical Properties

Sommario/riassunto

Up-to-date, comprehensive coverage on radiation-processed polymer materials and their applications Offering a unique perspective of the industrial and commercial applications of the radiation processing of polymers, this insightful reference examines the fundamental scientific principles and cutting-edge developments advancing this diverse field. Through a variety of case studies, detailed examples, and economic feasibility analysis, Radiation Processing of Polymer Materials and Its Industrial Applications systematically explains the commercially viable ways to process and use