

Radiation Effects on Polymers



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Radiation Effects On Polymers

Elsa Reichmanis



Radiation Effects On Polymers:

Radiation Effects on Polymers Roger Lee Clough, American Chemical Society. Meeting, 1991 Here is the most extensive resource on polymer radiation effects to be available in more than a decade This new volume reviews the fundamental chemistry and physics of polymer radiation interaction and examines recent progress in most major areas of the field Its 38 chapters written by leading experts from around the world cover fundamentals of polymer radiation chemistry technological applications of radiation to polymers including radiation processing radiation curing sterilization cross linking polymerization grafting X ray resists and others and degradation of stabilization of irradiated polymers including nuclear plants scintillation detectors for particle physics and others

Radiation Effects on Polymers for Biological Use Henning Kausch, 2003-07-03 Biomaterials repair reinforce or replace damaged functional parts of the human body All mechanical and biological interactions between an implant and the body occur across the interface which has to correspond as nearly as possible to its particular function Much of the progress in adapting polymer materials for use in a biological environment has been obtained through irradiation techniques For this reason the most recent developments in four key areas are reviewed in this special volume 1 the analysis of the topology and the elemental composition of a functional surface 2 the chemical modification of the surface which results in highly pure sterile and versatile surfaces 3 the sterilisation of implantable devices via ionising radiation and its possible effects on the structural mechanical properties of polymers and 4 the radiation effects on living cells and tissues which are of particular importance for radiation protection and radiotherapy

Radiation Effects in Polymeric Materials Vijay Kumar, Babulal Chaudhary, Vishal Sharma, Kartikey Verma, 2019-02-09 This book provides an introduction of how radiation is processed in polymeric materials how materials properties are affected and how the resulting materials are analyzed It covers synthesis characterization or modification of important materials e g polycarbonates polyamides and polysaccharides using radiation For example a complete chapter is dedicated to the characterization of biodegradable polymers irradiated with low and heavy ions This book will be beneficial to all polymer scientists in the development of new macromolecules and to all engineers using these materials in applications It summarizes the fundamental knowledge and latest innovations in research fields from medicine to space

Atomic Radiation and Polymers A. Charlesby, 2016-01-22 Radiation Effects in Materials Volume 1 Atomic Radiation and Polymers considers the theoretical and experimental studies on the association between polymers and atomic radiation The use of radiation in polymer science constitutes a powerful tool for the quantitative study of macromolecules This book consists of 31 chapters and starts with a brief introduction to fundamentals of atomic radiation and polymer structure The next chapters focus on some aspect of atomic radiation including radiation units radiation matter interaction and nuclear and electrical sources of radiation A chapter presents the appropriate methods to study radiation chemistry and polymer Considerable chapters are devoted to the molecular structure chemistry and reactions of polymers This volume also describes some significant chemical changes of

radiation Other chapters explore the properties and reactions of various irradiated polymers The remaining chapters deal with radiation protection effects in polymers which are processes wherein small changes in chemical structure within a molecule or in its neighborhood can exert a disproportionately large influence on the overall chemical reactions This book is of value to nuclear and solid state physicists organic and polymer chemists and nuclear engineers and radiobiologists *The Effect of Radiation on the Mechanical Properties of Polymers* R. K. Traeger,1964 *Irradiation Effects on Polymers* D.W. Clegg,A.A. Collyer,1991-07-31 The topics covered in this book may be divided into radiation effects on polymers test methods radiation processing and other applications of ionizing radiation *Atomic Radiation and Polymers* A. Charlesby,2016-06-06 Atomic Radiation and Polymers examines the effects of radiation on polymer materials The title deals with chemical changes that took place when polymers are exposed to radiation and how these changes affect the physical properties of the polymers The text first covers the interaction of radiation and matter along with radiation sources and dosimetry Next the selection deals with the general properties of long chain polymers The text also details the organic molecules and irradiated polymers Chapters 22 to 24 tackle the radiation induced changes in nuclear chain reaction while Chapter 25 discusses the irradiation of polymers in solution where both direct and indirect effects occur The next series of chapters details the theoretical aspects of reactions between the initial acts of ionization or excitation The last two chapters cover the conductivity change at low radiation intensities along with the data on radiation damage at very high intensities The book will be of great interest to researchers and practitioners from the field of nuclear science and polymer technology **Final Report on Studies of Radiation Effects on Polymers and Polymerization** Michael Szwarc,1973 **The Effect of Radiation on Properties of Polymers** Laurence W. McKeen,2020-08-20 The Effect of Radiation on Properties of Polymers examines the effects of radiation on plastics and elastomers Polymers are required in products or parts for a range of cutting edge applications that are exposed to radiation in areas such as space medicine and radiation processing This book focuses on the effects of radiation exposure within that environment providing in depth data coverage organized by category of polymer Aspects such as radiation impact on mechanical and thermal properties including glass transition and heat deflection temperatures are described demonstrating how changes in these properties affect the performance of plastic or elastomer parts The effect of radiation on electrical properties is also included Supporting introductory chapters explain the key concepts of radiation including the physical mechanical and thermal properties of plastics and elastomers This is a vital resource for plastics engineers product designers and R D professionals working on products or parts for radioactive environments as well as engineers and scientists in the medical nuclear and radiation processing industries The book also supports researchers and scientists in plastics engineering polymer processing and properties polymer and coatings chemistry materials science and radiation Brings together highly valuable data on the effect of radiation on the properties of polymers and elastomers Enables the reader to compare properties and to select the best possible materials for specific applications Supported by

detailed explanations and analysis ensuring that the reader understands how to interpret and utilize the data

Radiation Chemistry of Polymers V. S. Ivanov, 1992-06 Covers the main theoretical and practical problems involved in radiation chemistry of polymers The processes of polymerization and modification of polymers induced by ionizing radiation are described as well as the radiation resistance of polymers and their protection from radiation

Radiation Effects of Polymers, 1968

Ionizing Radiation Effects on Polymers and Polymer Nanocomposites Shelli Renee' Soltis Tatro, 2002

Radiation Effects in Polymer Systems R. W. Garrett, 1984

Radiation Effects in Polymers for Plastic Scintillation Detectors, 1994 Radiation damage studies were performed on polystyrene and poly vinyltoluene samples containing different concentrations of either an antioxidant A O 2 or a plasticizer PP 4 In addition parallel studies were carried out utilizing samples of these polymers prepared in the presence of cross linking agents such as NPG HDA and DVB The samples were irradiated using a ⁶⁰Co source to total doses of 1 and 10 Mrad at a dose rate of approximately 1 Mrad h Transmittance measurements were recorded before and immediately after irradiation and after oxygen annealing These experiments showed that none of these agents improved the radiation resistance of polystyrene and poly vinyltoluene with regard to their optical properties

Irradiation of Polymeric Materials Elsa Reichmanis, C. W. Frank, James H. O'Donnell, 1993 Focuses on the fundamental aspects of polymer radiation chemistry and the technological significance of the effect of radiation on polymers by examining such topics as the basic processes by which radiation interacts with polymers and the mechanisms that lead to chemical changes in the material Among the applications described are microlithography aerospace materials which have to be radiation resistant and biomedicine The date and location of the symposium are not noted Annotation copyright by Book News Inc Portland OR

The Effects of Radiation on High-technology Polymers Elsa Reichmanis, 1989 This timely volume provides a review of fundamental radiation chemical processes and their relationship to several high technology industries It demonstrates the significance of polymer radiation chemistry in industries such as electronics aerospace and optical recording Six review chapters and nine reports provide an in depth look into fundamental radiation chemistry recent advances in spectroscopic methods applications of radiation modified polymers in electronics and microlithography and resistance of polymers to radiation Research studies include polymer reaction to radiation at the molecular level energy dissipation pathways microscopic properties of polymers structure property correlations development of polymers for imaging at submicrometer resolution and more

Low Earth Orbital Atomic Oxygen and Ultraviolet Radiation Effects on Polymers Joyce A. Dever, 1991

Nuclear Science Abstracts, 1976

The Effects of Ionizing Radiation on Natural and Synthetic High Polymers Frank Alden Bovey, 1958

Energy Research Abstracts, 1992-10

The Enigmatic Realm of **Radiation Effects On Polymers**: Unleashing the Language is Inner Magic

In a fast-paced digital era where connections and knowledge intertwine, the enigmatic realm of language reveals its inherent magic. Its capacity to stir emotions, ignite contemplation, and catalyze profound transformations is nothing lacking extraordinary. Within the captivating pages of **Radiation Effects On Polymers** a literary masterpiece penned by a renowned author, readers attempt a transformative journey, unlocking the secrets and untapped potential embedded within each word. In this evaluation, we shall explore the book's core themes, assess its distinct writing style, and delve into its lasting impact on the hearts and minds of those that partake in its reading experience.

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