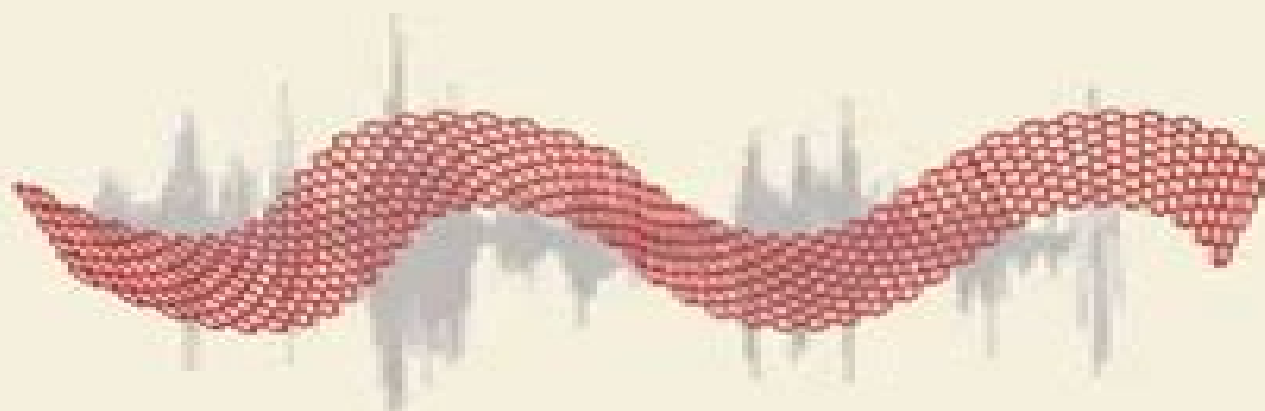


# **Polymeric Materials for Microelectronic Applications**

Science and Technology



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ACS Symposium Series 579

# Polymeric Materials For Microelectronic Applications

**Valery Shibaev**



## **Polymeric Materials For Microelectronic Applications:**

**Polymeric Materials for Microelectronic Applications** Hiroshi Ito, Seiichi Tagawa, Kazuyuki Horie, American Chemical Society. Division of Polymeric Materials: Science and Engineering, 1994      **Polymeric Materials for Microelectronic Applications** Hiroshi Ito, 1994 Reports recent developments in polymer science and technology pertinent to microelectronics Addresses such topics as photophysics and radiation physics and chemistry of polymers photoresists electron beam resists and X ray resists insulating materials in microelectronics photoresponsive materials silicon containing polymers conducting polymers and optoelectronic materials Includes international contributions from both academia and industry      **A Study of Polymeric Materials for Microelectronic Applications**, 1999      *Microelectronic Materials* C.R.M. Grovenor, 2017-10-05 This practical book shows how an understanding of structure thermodynamics and electrical properties can explain some of the choices of materials used in microelectronics and can assist in the design of new materials for specific applications It emphasizes the importance of the phase chemistry of semiconductor and metal systems for ensuring the long term stability of new devices The book discusses single crystal and polycrystalline silicon aluminium and gold based metallisation schemes packaging semiconductor devices failure analysis and the suitability of various materials for optoelectronic devices and solar cells It has been designed for senior undergraduates graduates and researchers in physics electronic engineering and materials science      Characterization of Polymeric Materials Used in Microelectronics, Electronic Packaging, and Sensor Applications Hartono Pranjoto, 1993      **Polymers for Electronic Applications** J.H. Lai, 2018-01-18 The object of this book is to review and to discuss some important applications of polymers in electronics The first three chapters discuss the current primary applications of polymers in semiconductor device manufacturing polymers as resist materials for integrated circuit fabrication polyimides as electronics packaging materials and polymers as integrated circuits encapsulates

**Microelectronics Packaging Handbook** R.R. Tummala, Eugene J. Rymaszewski, Alan G. Klopfenstein, 2013-11-27 Electronics has become the largest industry surpassing agriculture auto and heavy metal industries It has become the industry of choice for a country to prosper already having given rise to the phenomenal prosperity of Japan Korea Singapore Hong Kong and Ireland among others At the current growth rate total worldwide semiconductor sales will reach 300B by the year 2000 The key electronic technologies responsible for the growth of the industry include semiconductors the packaging of semiconductors for systems use in auto telecom computer consumer aerospace and medical industries displays magnetic and optical storage as well as software and system technologies There has been a paradigm shift however in these technologies from mainframe and supercomputer applications at any cost to consumer applications at approximately one tenth the cost and size Personal computers are a good example going from 500IMIP when products were first introduced in 1981 to a projected IIMIP within 10 years Thin light portable user friendly and very low cost are therefore the attributes of tomorrow s computing and communications systems Electronic packaging is defined as interconnection powering cool ing

and protecting semiconductor chips for reliable systems It is a key enabling technology achieving the requirements for reducing the size and cost at the system and product level

**Polymers for Electronic & Photonic Application** C. P. Wong, 2013-10-22 The most recent advances in the use of polymeric materials by the electronic industry can be found in *Polymers for Electronic and Photonic Applications* This book provides in depth coverage of photolithography microelectronic encapsulants and packaging insulators dielectrics for multichip packaging electronic and photonic applications of polymeric materials among many other topics Intended for engineers and scientists who design process and manufacture microelectronic components this book will also prove useful for hybrid and systems packaging managers who want to be informed of the very latest developments in this field Presents most recent advances in the use of polymeric materials by the electronic industry Contributions by foremost experts in the field

**Materials and Processes for Surface and Interface Engineering** Y. Pauleau, 2012-12-06 *Materials and Processes for Surface and Interface Engineering* which has been written by experts in the fields of deposition technology and surface modification techniques offers up to date tutorial papers on the latest advances in surface and interface engineering The emphasis is on fundamental aspects principles and applications of plasma and ion beam processing technology A handbook for the engineer and scientist as well as an introduction for students in several branches of materials science and surface engineering

**Sustainability of Polymeric Materials** Valentina Marturano, Veronica Ambrogio, Pierfrancesco Cerruti, 2020-08-10 This book will provide a comprehensive overview on the green approach to the research and industrialization of plastic materials An effort will be made to offer to the reader a critical perspective concerning both oil based plastics and novel bio based and waste derived polymer formulations A special focus on bio innovation in the area of organic materials will also be delivered

**Cooperative Research Associateships Tenable at the Naval Research Laboratory, Washington**, 1997

**Polymeric Materials for Electronics Packaging and Interconnection** John H. Lupinski, 1989 From a symposium of the ACS 196th meeting Los Angeles CA Sept 1988 Thirty nine chapters cover a broad spectrum of topics in four general areas physical chemistry of materials properties and applications of encapsulants and gels and printed circuit board substrates and materials Also includes a review of the marketing trends which drive packaging technology Annotation copyrighted by Book News Inc Portland OR

*Polymers as Electrooptical and Photooptical Active Media* Valery Shibaev, 2012-12-06 Polymeric materials have special advantages over other materials used for the recording storage and retrieval of information telecommunication transmission and visualization of images The authors describe the synthesis the physico chemical behavior and the applications of these highly sensitive macromolecular systems They discuss the most essential developments in this field For scientists and professionals working in the field of electrooptical and photooptical polymeric materials

**Chemical-Mechanical Polishing of Low Dielectric Constant Polymers and Organosilicate Glasses** Christopher Lyle Borst, William N. Gill, Ronald J. Gutmann, 2013-11-27 As semiconductor manufacturers implement copper conductors in advanced interconnect schemes research and development

efforts shift toward the selection of an insulator that can take maximum advantage of the lower power and faster signal propagation allowed by copper interconnects One of the main challenges to integrating a low dielectric constant low  $\kappa$  insulator as a replacement for silicon dioxide is the behavior of such materials during the chemical mechanical planarization CMP process used in Damascene patterning Low  $\kappa$  dielectrics tend to be softer and less chemically reactive than silicon dioxide providing significant challenges to successful removal and planarization of such materials The focus of this book is to merge the complex CMP models and mechanisms that have evolved in the past decade with recent experimental results with copper and low  $\kappa$  CMP to develop a comprehensive mechanism for low and high removal rate processes The result is a more in depth look into the fundamental reaction kinetics that alter selectively consume and ultimately planarize a multi material structure during Damascene patterning

**Adhesion in Microelectronics** K. L. Mittal, Tanweer Ahsan, 2014-08-25 This comprehensive book will provide both fundamental and applied aspects of adhesion pertaining to microelectronics in a single and easily accessible source Among the topics to be covered include Various theories or mechanisms of adhesion Surface physical or chemical characterization of materials as it pertains to adhesion Surface cleaning as it pertains to adhesion Ways to improve adhesion Unraveling of interfacial interactions using an array of pertinent techniques Characterization of interfaces interphases Polymer polymer adhesion Metal polymer adhesion metallized polymers Polymer adhesion to various substrates Adhesion of thin films Adhesion of underfills Adhesion of molding compounds Adhesion of different dielectric materials Delamination and reliability issues in packaged devices Interface mechanics and crack propagation Adhesion measurement of thin films and coatings

**Microlithography/Molecular Imprinting**, 2005-02-18 1 J D Marty M Mauzac Molecular Imprinting State of the Art and Perspectives 2 H Ito Chemical Amplification Resists for Microlithography

**Proceedings of the Third International Conference on Microelectronics, Computing and Communication Systems** Vijay Nath, Jyotsna Kumar Mandal, 2019-05-23 The book presents high quality papers from the Third International Conference on Microelectronics Computing Communication Systems MCCS 2018 It discusses the latest technological trends and advances in MEMS and nanoelectronics wireless communications optical communication instrumentation signal processing image processing bioengineering green energy hybrid vehicles environmental science weather forecasting cloud computing renewable energy RFID CMOS sensors actuators transducers telemetry systems embedded systems and sensor network applications It includes papers based on original theoretical practical and experimental simulations development applications measurements and testing The applications and solutions discussed in the book provide excellent reference material for future product development

Advanced and Emerging Polybenzoxazine Science and Technology Hatsuo Ishida, Pablo Froimowicz, 2017-01-18 Advanced and Emerging Polybenzoxazine Science and Technology introduces advanced topics of benzoxazine resins and polybenzoxazines as presented through the collaboration of leading experts in the benzoxazine community representing the authoritative introduction to the subjects Broad topics

covered include the recent development and improved understanding of the subjects including low temperature cure aerogels and carbon aerogels smart chemistry in fire retarding materials and coatings metal containing benzoxazines rational design of advanced properties and materials from natural renew In the past twenty years the number of papers on polybenzoxazine has continuously increased at an exponential rate During the past three years the number of papers published is more than the previous 17 years combined The material is now part of only a few successfully commercialized polymers in the past 35 years Therefore interest in this material in both academia and industry is very strong Includes the latest advancements in benzoxazine chemistry Describes advanced materials such as aerogels carbons smart coatings nanofibers and shape memory materials Includes additional characterization data and techniques such as FT IR Raman NMR DSC and TGA analyses

**High-Performance Polymer...** Guy Rabilloud, This is a general reference book for materials scientists polymer chemists manufacturers of electronic and optoelectronic devices and process engineers It is also a textbook for libraries of major chemical and semiconductor companies research institutions government laboratories and universities

**BOOK JACKET** *Concise Polymeric Materials Encyclopedia* Joseph C. Salamone, 1998-08-28 Concise Polymeric Materials Encyclopedia culls the most used widely applicable articles from the Polymeric Materials Encyclopedia more than 1 100 and presents them to you in a condensed well ordered format Featuring contributions from more than 1 800 scientists from all over the world the book discusses a vast array of subjects related to the synthesis properties and applications of polymeric materials development of modern catalysts in preparing new or modified polymers modification of existing polymers by chemical and physical processes biologically oriented polymers This comprehensive easy to use resource on modern polymeric materials serves as an invaluable addition to reference collections in the polymer field

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