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edible films and coatings play an important role in the quality safety transportation storage and display of a wide range of fresh and

processed foods edible films and coatings while preventing moisture loss and maintaining quality prevent spoilage and microbial contamination of foods the edible film and coating industry is now a multimillion dollar industry less than 1 million in 1999 the market has grown to more than 100 million and is expected to grow to 350 million by 2008 according to james rossman of rossman consulting pharmaceutical and consumer products have been responsible for the tremendous increase this growth has produced an enormous amount of scientific articles patents and research projects undertaken by members of the food industry academia and research institutions edible films and coatings for food applications brings together this vast wealth of scientific knowledge in a systematically organized volume it examines the science application function and market for edible films and coatings

there has been intense research into edible coatings and films in recent years for many reasons including consumer interests in health food quality convenience and safety the fact that edible coatings can conceivably reduce the complexity and improve recyclability of packaging and food scientists and engineers have isolated new materials that present new opportunities in the formation and properties of edible coatings and films the intent of this book is to introduce newcomers to the field describe materials appropriate for use summarize properties review methods for application describe approaches for mathematical modeling and summarize present and potential uses

this 3e edited by peter m martin pnnl 2005 inventor of the year is an extensive update of the many improvements in deposition technologies mechanisms and applications this long awaited revision includes updated and new chapters on atomic layer deposition cathodic arc deposition sculpted thin films polymer thin films and emerging technologies extensive material was added throughout the book especially in the areas concerned with plasma assisted vapor deposition processes and metallurgical coating applications

this book chronicles the proceedings of the international symposium on adhesion measurement of films and coatings held in boston the articles in this book were previously published in three special issues of the journal of adhesion science and technology films and coatings are used for a variety of purposes and their adequate adhesion to the und

this book highlights the fundamentals of thin films and coatings including deposition techniques and material properties the book showcases real world applications in electronics optics nanotechnology and aerospace highlighting how these materials improve performance and durability it also explores emerging trends such as smart coatings and sustainable options making it a comprehensive resource for those seeking to leverage the potential of thin films and coatings in engineering with both theoretical foundations and practical insights it is a valuable reference for researchers and professionals in this dynamic field

with the growing concern for the environment and the rising price of crude oil there is increasing demand for non petroleum based polymers from renewable resources biopolymer films have been regarded as potential replacements for synthetic films in food packaging

due to a strong marketing trend toward environmentally friendly materials biopolymer based films and coatings display good barrier properties flexibility transparency economic profitability and environmental compatibility therefore they have successfully been used for packaging various food products biopolymer based films and coatings trends and challenges elaborates on the recent methods and ingredients for making biodegradable films and coatings as well as the current requirements for food security and environmental issues this book also explores films and coatings prepared with essential oils antimicrobial substances and bioactive components that make up this active packaging films and coating chapters are based on biopolymers used to prepare films and coatings that is carbohydrates lipids proteins and so on this book provides a platform for researchers and industrialists on the basic and advanced concepts of films and coatings key features provides a comprehensive analysis of recent findings on biopolymers carbohydrate protein and lipid based films and coatings contains a wealth of new information on the properties functionality and applications of films and coatings presents possible active and functional components and ingredients for developing films and coatings guides start up researchers on where to start the latest research work in packaging it has been estimated that the global production of bioplastics is set to hike from 2 11 in 2020 to 2 87 million tonnes in 2025 further the demand for fresh ready to eat or semi finished foods is increasing and the need to maintain food safety and quality further exacerbates the challenges in the supply chain especially with the globalization of food trade and the use of centralized processing facilities for food distribution it is an urgent requirement to increase shelf life and reduce food product loss considering the great market demand for biodegradable material based packaging systems this book comes at an opportune time to enable researchers and food scientists to develop suitable solutions considering the sustainability and economic feasibility of the process

reviews diamond films and coatings covering their properties growth deposition characterization and applications

this book documents the proceedings of the second international symposium on adhesion measurement of films and coatings held in newark nj october 25 27 1999 since the first symposium boston 1992 there had been considerable activity in devising new more reliable and more efficient ways to measure adhesion of films and coatings which resulte

thin film coatings properties deposition and applications discusses the holistic subject of conventional and emerging thin film technologies without bias to a specific technology based on the existing literature it covers properties and delves into the various methods of thin film deposition including the most recent techniques and a direction for future developments it also discusses the cutting edge applications of thin film coatings such as self healing and smart coatings biomedical hybrid and scalable thin films finally the concept of industry 4 0 in thin film coating technology is examined this book explores a wide range and is not specific to material and method of deposition demonstrates the application of thin film coatings in nearly all sectors such as energy and anti microbial applications details the preparation and properties of hybrid and scalable ultra thin materials for advanced applications provides detailed bibliometric analyses on applications of

thin film coatings discusses industry 4 0 and 3d printing in thin film technology with its broad coverage this comprehensive reference will appeal to a wide audience of materials scientists and engineers and others studying and developing advanced thin film technologies

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this book covers the basic principles and application of nanoindentation technology to determine residual stresses in films and coatings it briefly introduces various detection technologies for measuring residual stresses while mainly focusing on nanoindentation subsequently nanoindentation is used to determine residual stresses in different types of films and coatings and to describe them in detail this book is intended for specialists engineers and graduate students in mechanical design manufacturing maintenance and remanufacturing and as a guide to the practice of production with social and economic benefits

this second edition edited by the world renowned dr rointain bunshah is an extensive update of the many improvements in deposition technologies mechanisms and applications considerably more material was added in plasma assisted vapor deposition processes as well as metallurgical coating applications

emcompasses three major parts of the development of nanocomposite films and coatings processing and properties mechanical performance functional performance and includes wide application areas ranging from mechanical cutting to solar energy and from electronics to medicine

this volume presents the most up to date and detailed information available on protein based biopolymer films and coatings it provides a comprehensive overview of the design technology properties functionality and applications of biopolymer films and coatings edible and inedible from plant and animal proteins both widely commercialized and envisioned applications of protein films are discussed including hard and soft gelatin capsules microcapsules collagen casings and meat and produce coatings expert contributors provide thorough reviews

of related interdisciplinary research and extensive lists of references about the editor aristippos gennadios ph d is senior manager materials science and clinical supplies product development us and canada banner pharmacaps inc a sobel nv company in high point north carolina he received his b s in chemical engineering from the national technical university in athens greece his m s in agricultural engineering from clemson university and his ph d in agricultural and biological systems engineering from the university of nebraska in lincoln dr gennadios is also adjunct associate professor in the department of biological systems engineering at the university of nebraska in lincoln he has authored or co authored over 40 refereed publications and has been granted 2 u s patents

in science as well as in industry the impetus of research on bio based polymers has recently expanded into new terrains the need to replace fossil based materials with sustainable and renewable sources is one of the main drivers for the emergence and the development of new and environmentally friendly materials while some materials applications of bio based polymers are already very well established for instance in paper and textiles others have just emerged with thin films and coatings being a recent and particular area of interest thin films in general are an enormous field of research both fundamentally and from an applied perspective with uses ranging from corrosion resistance to photovoltaics and sensors since bio based materials are a relatively novel source material for thin films the research in this area is at a fresh exciting stage at the moment

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