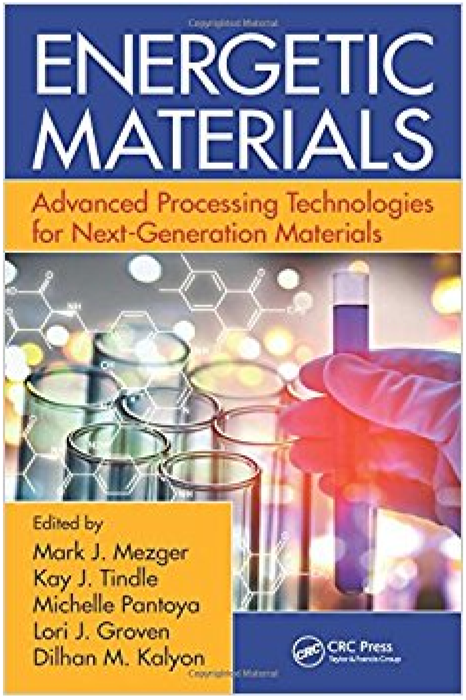
Energetic Materials: Advanced Processing Technologies For Next-Generation Materials



Synopsis

This book will take an in-depth look at the technologies, processes, and capabilities to develop and produce "next generation" energetic materials for both commercial and defense applications, including military, mining operations, oil production and well perforation, and construction demolition. It will serve to highlight the critical technologies, latest developments, and the current capability gaps that serve as barriers to military fielding or transition to the commercial marketplace. It will also explain how the processing technologies can be spun out for use in other non-energetics related industries.

Book Information

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Customer Reviews

"This book is an excellent collection of current technical strategies in the field of energetic materials. Its writers and editors are leaders in the EM community. The preface provides good background on the current state and need of the field, while each chapter narrates current strides, goals and difficulties." Ã¢â ¬â ¢ Jena McCollum, University of Colorado Colorado Springs, USA "This book is unique in so far as it does not only describe the synthesis of (new) energetic materials, but also discusses thermodynamic aspects, physical properties and diagnostics of such materials. Another equally important feature that makes this book highly valuable is its inclusion of the discussion of the transition from laboratory scale to industrial production. I am sure this book is going to become a "must" for all researchers in the field of energetic materials Ã¢â ¬â œ whether they are academic or industrially-based people."Ã¢â ¬â ¢ Thomas M. KlapÃƒÂ¶tke, Ludwig-Maximilians-UniversitÃƒÂ¤t MÃƒÂ nchen, Germany "This book is set apart from all others in the related field. It meshes a good bit of technical aspects with the program management of how business is done as it related to the energetic materials enterprise."Ã¢â ¬â ¢ Scott Iacono, US Air Force Academy, Chemistry Research Center, USA "Excellent review. This book should find a place in the shelves of researchers in this area, administrators and law makers involved in funding research in this area."Ã¢â ¬â ¢ Dabir S. Viswanath, University of Missouri, Columbia, Missouri, USA and University of Texas at Austin, USA "By expertly discussing long-standing grand challenges to EM research, development, and production -in one text- this book serves as a Rosetta Stone; it enables our researchers, managers, and government officials to clearly understand each otherÃ¢â ¬â„¢s language, constraints, and priorities. The broad reaching scope of this book will help make possible the necessary retooling of administrative and EM manufacturing infrastructures including the introduction of science-based principles into the energetic materials enterprise. In short, Energetic Materials: Advanced Processing Technologies for Next-Generation Materials is an essential business and PLM guidebook for modernizing the energetic materials industry."Ã¢â ¬â ¢ Joseph M. Zaug, Lawrence Livermore National Laboratory, Livermore, California, USA

Mr. Mark J. Mezger is Senior Technology Advisor for Energetics Development Initiatives at the US Army Armament Research Development and Engineering Center at Picatinny Arsenal, NJ, where he earlier held positions in the Office of the Director of Technology, and the Business Interface Office. Through the establishment of public-private partnerships, Mr. Mezger created a national nanotechnology network with regional areas of expertise. He also served as RDECOM Nanotechnology Integrated Product Team Chairman. Through his associations with the National Nanotechnology Manufacturing Center in Georgia, Pennsylvania NanoMaterials Commercialization Center technical advisory board, the Lehigh Valley Nanotechnology Network, the Nanotechnology Enterprise Consortium in Missouri, and the Greater Garden State Nanotechnology Alliance, he has established for the Army one of the largest nano particle reactor facilities in North America and is currently involved in applying this technology to explosive and reactive materials. His ExMT in Technology Management is from the Wharton School at the University of Pennsylvania and Bachelors of Science degrees in Math-Physics and in Engineering Science are from the SUNY at Buffalo. Dilhan M. Kalyon holds the Institute Professor Chair at Stevens Institute of Technology and is affiliated jointly with the Department of Chemical Engineering and Material Science and Department of Chemistry, Chemical Biology and Biomedical Engineering. He is also the Founding

Director of the Highly Filled Materials Center at Stevens since 1989. Prof. Kalyon has received the International Research award of Society of Plastics Engineers (2008), the Thomas Baron award in fluid-particle systems of American Institute of Chemical Engineers (2008), the Harvey N. Davis Distinguished Teaching Assistant Professor award (1987), Exemplary Research Award (1992), Henry Morton Distinguished Teaching Full Professor award (2000), Honorary M. Eng. degree, honoris causa (1994) and the Davis Memorial award for Research Excellence (2009) from Stevens Institute of Technology, the FounderÃ¢â ¬â„¢s award of JOCG Continuous Extrusion and Mixing Group (2004), and various fellowships including DuPont Central Research and Development Fellowship (1997), Exxon Education Foundation Fellowship (1990) and Unilever Education Fellowship (1991). He was elected Fellow of the Society of Plastics Engineers (2004) and Fellow of American Institute of Chemical Engineering (2006). Dr. Lori J. Groven is an Assistant Professor for the Department of Chemical and Biological Engineering at South Dakota School of Mines and Technology. Prior to this appointment she served as an Assistant Research Faculty in the School of Mechanical Engineering at Purdue University, West Lafayette, IN. She is an experimentalist focused on the combustion, characterization, processing, and improvement of materials ranging from traditional materials to the nanoscale for propulsion and energy storage. Her research has included the study of combustion of nanosized powders to synthesize intermetallic and ceramic materials, small scale propagation of gasless reactions, direct write of biocidal materials, and most recently has focused on additive manufacturing routes for energetic materials, to name a few. She is the author or co-author of more than 30 peer reviewed publications since 2010. Dr. Michelle Pantoya is the J. W. Wright Regents Chair in Mechanical Engineering and a professor at Texas Tech University. Her research focuses on developing new nanoscale energetic materials used for both industrial as well as military applications. Her vision is to promote cleaner, safer and more effective energetic composites through an understanding of their basic combustion behavior. Her advances were recently aired on a segment of the Discovery ChannelÃ¢â ¬â„¢s Daily Planet entitled Green Ammunition. The news story explains her scientific contributions to remove lead-based materials engrained in most ordnance systems with environmentally safe and more reactive nano-particle formulations. She is making tremendous strides through creating new diagnostic techniques for probing combustion reactions on the nanoscale; and then bridging these findings to describe a reactive materialÃ¢â ¬â„¢s macroscopic behavior. Her ability to establish the link between how phenomena occurring on the nanoscale affect the energetic performance of a pyrotechnic on the macroscale is one example of a scientific contribution that has made her a leader at the frontiers of knowledge in energetic materials combustion. Another more fundamental impact that broadly advances science is her research to introduce an entirely new mechanism by which a reaction can occur based on a dispersion rather than a classical diffusion process. She received US Presidential recognition for her work as a recipient of the prestigious PECASE award in 2004. Ms. Kay J. Tindle currently serves as the Senior Director for the Research Development Team (RDT) in the Office of the Vice President for Research at Texas Tech University. Ms. Tindle received her Bachelor of Arts in Teaching English as a Foreign Language from Oklahoma Christian University and her M.Ed. in Adult and Higher Education from the University of Central Oklahoma. She is currently a doctoral candidate in the Higher Education Research program with plans to defend her dissertation in Spring 2017. Her research focuses on multidisciplinary teams as mechanisms of accountability, communication practices and innovations among multidisciplinary teams, and women leaders in higher education.