

Metal-Fluorocarbon Based Energetic Materials

The excellent book *Metal-Fluorocarbon Based Energetic Materials*, by Ernst-Christian Koch, gives an accurate overview of the past, present, and future state of research on metal-halocarbon formulations and their manufacture and applications. It begins with the history of the discovery and development of these materials and their applications in ordnance systems. In the following three chapters, the author presents detailed information about the properties of fluorocarbons, metals, and their fluorides, as well as on the reactive properties and thermochemistry of some metal-fluorocarbon systems. The next three chapters (6–8) are devoted to ignition and combustion mechanisms in metal-halocarbon energetic materials. Chapter 9 includes IR and UV/Vis spectra of flames produced by different metal-fluorocarbon materials at various stoichiometries and pressures. This is an ideal introduction to the comprehensive Chapters 10 and 11, in which the author describes the applications of formulations containing metal-fluorocarbon pyrolants as infrared emitters and as obscurants.

Chapters 12–16 describe less common military and civil applications of these versatile materials as igniters, incendiaries, reactive fragments, underwater pyrotechnics, explosives components, propellants, or as substrates in self-propagating high-temperature synthesis of carbon and ceramic nanostructures, as well as in the form of metal-fluorocarbon multi-layer foils. Finally, in Chapters 17–20, the author discusses ageing processes, manufacturing methods, sensitivity, and safety aspects of the most commonly used metal-fluorocarbon pyro-

lants, the magnesium–Teflon–Viton (MTV) compositions.

The book provides a complete set of detailed information on one specific group of energetic materials, which is presented in an informative and didactic manner. In addition to that, each chapter is extensively referenced, thus providing a useful guide to information sources for more experienced readers or for those wishing to explore a subject in greater depth. The author also cites many personal communications regarding not only unique features and future developments of metal-halogen reactions, but also information on military applications, which is less generally available due to security constraints. Therefore, the book can be very useful for anyone who wants to expand his/her knowledge and understanding of metal-halocarbon pyrolants, including the design, optimization, preparation, and characterization of compositions, and their applications. But the most important merit of the book is the fact that all the data are creatively interpreted by the author through his enormous theoretical and practical knowledge of this unique class of energetic materials. Undoubtedly, it will serve as a valuable addition to any explosives and pyrotechnics library, especially since it skillfully combines theoretical background with experimental and technological facts on all aspects of metal-halocarbon-based energetic materials.

Summing-up, I recommend this book to all readers (graduate students, researchers, and technologists) who are interested in MTV-like compositions, as it is a valuable source of information and a complete overview of the specialist literature combined in a single volume.

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