

Foreword 3

I feel privileged to write a foreword to this book, authored by S. Venugopalan who was my senior colleague in HEMRL for a number of years. I can recall that with his rich experience in the field of high energy materials (HEMs) and a strong background in fundamental and applied chemistry, many of the scientific officers and staff would approach him to clarify their doubts in this field, be it propellants or explosives or the synthetic organic chemistry related to HEMs. He was a popular teacher and invited speaker on various subjects, particularly on HEMs and there was a growing request from the scientific fraternity of the laboratory that he should write a popular book mainly focusing on the basic concepts governing HEMs, their development, and applications. This book is the result of such a request and hard work by the author.

The author gives a lucid elucidation of some basic terms such as explosives, HEMs, deflagration, detonation, etc., with examples and also the classification of HEMs. His explanation of the energetic aspects of HEMs based on thermochemistry, especially the significance of the heats of formation of HEMs is quite original and outstandingly clear. The network chart depicting the interrelationship between different parameters of HEMs, at the end of Chapter 2 excellently sums up the basic concepts of HEMs. As the author makes it clear in the preface, this book is meant mainly to create an interest in the field of HEMs among the beginners. A college student with a degree in chemistry can easily understand the intricacies related to explosives, propellants, and pyrotechnics and can be motivated to choose HEMs as his/her career. The book touches upon all the aspects concerning HEMs including safety and security concerns, instrumental analysis for their characterization and performance evaluation, future trends, and interestingly, the constructive applications of HEMs. The worked examples of numerical problems in quite a few chapters and the questions at the end of each chapter should be useful to the readers.

In light of my above comments, I strongly feel that this book should find a place not only with every scientist and technologist working in institutions handling HEMs but also in the libraries of colleges teaching chemistry to enhance the awareness about the importance and scope of HEMs. Apart from the beginners, even an experienced researcher in the field of HEMs will find this book an asset as he will understand the broader perspective of the entire gamut of HEMs that will help him in his work. I am confident that the book will be a unique **popular science publication** with the hope that **HEMs chemistry** may become a part of the chemistry curriculum in many universities and colleges, like other branches of chemistry, in the near future.



**(Dr. Mahadev B. Talawar), Scientist,
High Energy Materials Research Laboratory (HEMRL), Pune, India.**

Dr Talawar was awarded PhD from Karnataka University, India, in 1994. He has been working in the indigenous development of advanced HEMs of defense interest for two decades. He has authored/coauthored nearly 150 research papers in the area of materials science in the peer-reviewed national and international journals of repute. He has presented several research papers in national and international seminars in the area of HEMs. He was a visiting scientist at Mendeleev University of Chemical Technology, Moscow, Russia, during 1998. Dr Talawar is also serving as an Editorial Board member for reputed journals such as Journal of Hazardous Materials, USA and Combustion, Explosion and Shockwaves from Russia. He has also been reviewing research papers in the area of materials science for many international journals. Dr Talawar worked as a Senior Chemical Weapons Inspector for the Organization for the Prohibition of Chemical Weapons (OPCW) at the Netherlands during 2005–2012. During this period, he acquired unique experience in the specialized field of destruction of chemical weapons. As a part of OPCW, he has visited about 50 countries and immensely contributed to various inspection activities.