Rocket propellants are hugely important members of the larger group of energetic materials. This continuously developing field requires knowledge and understanding of a wide-range of compounds from the highly reactive fluorine and nitrogen oxides, to organic alkylboranes and alcohols. For rocket propulsion, it is essential that accurate information on the physical and chemical properties of the chemicals involved has been determined precisely and can be relied upon. This is not only the case for known rocket propellants, but is equally essential for developing new, “greener” (less toxic) propellants for the future. The demands on rocket propellants are continuously developing and changing with time, as new needs and requirements for satellites and rockets emerge. Therefore, the Encyclopedia of Rocket Propellants is an essential resource for understanding current and past rocket propellants, as well as for designing those for the future. A collection of the vast physical and chemical data for past, present and modern rocket propellant systems has been missing, and it is essential that a source is available in which all reliable data has been collected together and presented in a clear and informative manner.

Amongst the many ways to categorize propellants for chemical rockets, they can be separated into two groups, namely, solid propellants or liquid propellants, with the former being subdivided into double-base or composite propellants. Liquid propellants can be subdivided into monopropellants or bipropellants, the latter of which can be again subdivided into hypergolic or nonhypergolic. Therefore, the complexity of these systems is self-evident. Hydrazine and the methylated derivatives methylhydrazine (MMH) and unsymmetrical dimethylhydrazine (UDMH) in combination with nitric acid or dinitrogen tetroxide are currently the most widely-used hypergolic propellants, however, hydrazine and its methylated derivatives are not only toxic, but also carcinogenic in test animals, and therefore it is of considerable importance to find less-toxic and non-carcinogenic alternatives which can still form hypergolic mixtures. Properties of many candidates in this context are summarized in this book. However, many more promising alternatives need to be found for the future. Despite the harmful properties of “traditional” rocket propellants such as MMH or UDMH, or the highly corrosive WFNA and RFNA, they continue to be used, while safer and more energetic alternatives are sought for the future.

Searching for new, environmentally friendly and/or increased performance rocket propellants requires knowledge of a large and diverse number of chemical compounds, many of which are not easy to handle. Despite this, since the publication of the book Raketentreibstoffe (Springer) in 1968 by the same author as this

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encyclopedia, no other such comprehensive and detailed book has been published on rocket propellants making the *Encyclopedia of Rocket Propellants* a seminal work for past, present and future developments in this area.

Prof. Dr. Thomas M. Klapötke  
Department of Chemistry  
Ludwig-Maximilians University  
Munich, Germany