Organic Chemistry of Explosives, by J. P. Agrawal and R. D. Hodgson, Wiley: Chichester, **2007** (reprint with corrections), hardcover, 414 pp, £90/€135/US$180, ISBN 978-0-470-02967-1

Survey on the Synthesis of Highly Energetic Compounds

The modern world would not exist without the invention and availability of powerful and 'safe' organic explosives. Most explosives and propellants are based on highly nitrated compounds. Since tremendous efforts are currently made in the research of trace detection of explosives, such a monograph about potentially occurring highly energetic organic compounds comes right in time. Therefore, this well-written book is of general interest for a broad scientific community. The monograph focuses on the synthetic strategies to construct highly energetic materials but does not provide detailed procedures for making these dangerous compounds. It is noteworthy that the preparation of explosives and procuring chemicals therefor, without a license, is a serious criminal offence!

Agrawal and Hodgson are well-known scientists in their field and created a book that surveys the officially accessible literature about this particular area, covering references mostly up to 2004. The book is arranged into nine chapters that are devoted to particular functionalities of the explosives or the employed reagent for the synthesis thereof. Since nitro compounds play a dominant role in this area, the major part of this book is devoted to the installation and conversion of these specific functionalities. Consequently, this monograph provides a broad survey of direct and indirect nitration methods. Since the nitration is an utmost useful transformation in preparative organic chemistry, these chapters are a unique treasure trove for scientists facing up to the installation of a nitro moiety onto challenging architectures. The construction of polynitropolycyclic alkanes reflects synthetic efforts similar to the synthesis of a complex natural product. These sequences underline the power of the described methodologies. Subsequent chapters deal with nitramines and nitrogen-rich heterocycles in the same aspect. In chapter 8, azides, peroxides and diazo compounds are discussed. Despite their lower commercial significance, a more detailed treatment would be appropriate since such compounds often occur in home-made explosive devices. Such information would be particularly useful for scientists in the area of homeland security. The last chapter deals with dinitrogen pentoxide as an eco-friendly nitration reagent and its applications. The major advantages of employing this nitration reagent are that strong acids and excess of reagent can be avoided. Mechanistic rationales for several transformations would be very helpful for the reader – the nitramine rearrangement, for example (p. 145). Unfortunately, novel concepts which substitute lead and mercury salts by nitrogen-rich organic compounds, such as 'green explosives' are only mentioned indirectly (p. 284).

The number of typos in the written part and the schemes is on a tolerable level. Chemical mistakes are rare and demonstrate the careful work of the authors. The numbering of the compounds and figures is consistent for the individual chapters. The index as well as the list of abbreviations is extremely useful, the latter because explosives and propellants are usually only mentioned by their abbreviations. Unfortunately, the IUPAC nomenclature is not applied several times (p. 253). However, aromatic and aliphatic nitro derivatives are of huge industrial importance and are invaluable intermediates for organic synthesis. With about 1500 references and many citations leading to existing reviews and further reading, this high-quality book is an indispensable reference that should find its place in every good scientific library.

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