

**Phosgenations – A Handbook**, by L. Cotarca and H. Eckert, Wiley-VCH: Weinheim, 2004, hardcover, 656 pp., € 219, ISBN 3-527-29823-1

*The world of phosgenation reactions...*

No other bulk chemical has as bad a reputation as phosgene. Because of the warfare application in World War I and its toxicity, this compound has to face a variety of prejudices and widespread resentments. I well remember how much respect I had as a student when using liquefied phosgene for the preparation of chloroformates.

Cotarca and Eckert, two distinct experts on the chemistry of phosgene and its substitutes, wrote a book about this particular topic. The monograph addresses mainly research and synthetically oriented chemists. The book is organized into nine chapters and starts with a very short introduction. Phosgene exhibits a unique reactivity and represents a powerful reagent for several transformations such as chloroformylation, carbonylation, chlorination and dehydration reactions. Therefore, most of the substitutes which are introduced in the second chapter can be exploited for only one specific transformation. The industrial preparation of phosgene and the challenges thereof are surveyed. The decomposition of di- and triphosgene is discussed in detail. Consequently, this particular informative part of the book should be a compulsory reading for chemists employing phosgene as reagent. Unfortunately, the transition states in the mechanistic explanations are not labelled as such and are sometimes not very likely (p. 21). The third chapter is devoted to the evaluation of the phosgenation reagents and includes physical, as well as physiological, data of the corresponding chemicals. In mechanistic contributions, the common knowledge for the coordination of Lewis acids like  $\text{AlCl}_3$  to the oxygen of acid chlorides is ignored (p. 35). More than 65% of the monograph is taken up by the fourth chapter which provides a vast collection of phosgenation reactions. Many detailed practical procedures are found in this section. The above-mentioned four different transformations are dis-

cussed in detail and are supplemented by representative examples. However, in my opinion, TLC seems not to be an adequate method to monitor the synthesis of chloroformates (p. 48). Several topics, for example the formation of isonitriles, are excessively treated and add unnecessarily to the size of the book. The following chapter demonstrates the application of these transformations for the construction of technically relevant drug molecules and natural products. Since some examples have been discussed previously, the fourth and fifth chapters contain large fragments of redundancy. In the sixth section, a direct comparison of the individual phosgenation reagents on a selected transformation is given. The next chapter deals with safety aspects and different sources of phosgene. This particular survey should definitely be located earlier in the book, since the corresponding information is vital for practical work. A very common and less expensive source of phosgene for laboratory applications is a solution (20%) in toluene. This option is mentioned only once, in Table 7.2, and no details on its handling are given. A contribution on analytical tools for the detection of phosgene and a small outlook conclude the book. The mistakes in the schemes are obvious (e.g. pp. 18, 271) and together with those in the text are on a tolerable level.

As a final cautionary note, the reader will quickly become aware that one of the authors founded a company that provides several phosgenation agents. The frequent reminders of this, throughout the book, both distract the reader and detract significantly from the supposed objectivity of scientific communication.

In summary, this monograph provides a good survey on the chemistry of phosgene and its derivatives. Due to the rather specialized information and the largely redundant parts, this monograph should only be recommended for specialists or scientists interested in this particular field.

**Siegfried R. Waldvogel**, Kekulé-Institut für Organische Chemie und Biochemie, Universität Bonn, Germany