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BOOK REVIEW

Frank H. Herbstein, Crystalline Molecular Complexes and Compounds, Vols. 1 and 2

Oxford University Press, Oxford, UK, 2005, xxviii + 1280 pp

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For quite a few years, on my rare visits to the TECHNION, Frank Herbstein told me about the progress of his opus magnum, which seemed to be almost impossible to complete. To review the growing literature of crystalline molecular complexes by a single person seemed to be a superhuman effort. The task was, however, successfully completed and the book came out as volume 18 in the authoritative series of the *Monographs on Crystallography* of the International Union of Crystallography. It is not a mere report of the accumulated literature; rather, it is a critical overview of a well-selected and representative portion of the relevant and available information. It is broad in scope in that, for instance, it considers DNA as relevant member of the molecular complexes, referring to the hydrogen bonding holding its two strands together. It is rich in detail in that, for instance, it provides geometrical parameters of numerous molecular structures. Yet it is not attempting to include every relevant species whose crystalline molecular structure has ever been determined; rather, it leaves such comprehensiveness to larger series and compilations.

In an approach seldom practiced in our reviews, here we list all chapter titles (in a shortened version in some instances) to provide information on the contents of this exceptional monograph:

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16 Crystal physics of mixed-stack π–π^* molecular compounds
17 Segregated stack π-molecular complexes

There are close to 4,000 references distributed among the chapters, some 200 tables with numerical data, and some 600 diagrams of molecular structures and crystal packing arrangements. In addition to the research value of the monograph, it was prepared with didactics in mind as well. The presentation is clear and the explanations are easy to digest. The description of thermodynamic stability of molecular complexes in Appendix 1 could be used directly in any freshman chemistry course for its clarity.

When using this monograph it is important to bear in mind not only what it includes, but also what it does not. The author is careful to claim comprehensiveness in covering structural information on crystalline materials. So gas-phase structures are not mentioned. The material presented here, however, will also be very useful in comparing crystalline and gaseous structures, which is very much among the focal points of the contributors to and users of *Structural Chemistry*. Such comparisons may reveal important knowledge concerning the nature of both intermolecular and intramolecular interactions in the crystal. Structural information on gaseous, i.e., free molecules is available in periodicals, including ours, and in compilations, notably in the Landolt–Börnstein series.

The present monograph represents great value for chemists, physicists, biologists, and technologists due to the multifaceted discussion and evaluation of the various properties of the broad classes of substances critically reviewed in it. Furthermore, all structural and molecular scientists will benefit from the general observations of trends in structural variations made by the author or reviewed by him relying on the relevant literature.