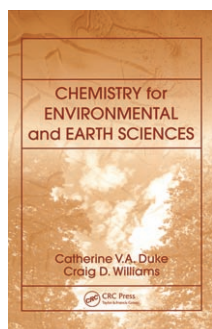


category. This will be of great benefit to people who are not familiar with these tools, since otherwise they would need to refer to other books or companion volumes. As such, the book will attract a broad readership with diverse backgrounds and interests, including chemists, biochemists, food scientists, and technologists involved with the processing of polysaccharides, in the paper, textile, cosmetics, biofuels, and other industries.

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Chemistry for Environmental and Earth Sciences



By Catherine V. A. Duke and Craig D. Williams. CRC/Taylor & Francis, Boca Raton 2007. 230 pp., softcover £ 24.99.—ISBN 978-0-8493-3934-9

Chemistry serves an enabling science for many other scientific disciplines. In this textbook, the authors have set out to provide students of environmental and earth sciences with a basic knowledge of chemistry. The book has been written with a refreshing degree of élan and didactic skill, and on the whole it succeeds well in its aim, except for a few faults. The main emphasis is on the

fundamentals of inorganic chemistry, which are covered in four main chapters. Each of the subchapters contains “self-assessment questions” to enable the student to test his or her learning of the material, and answers are given in the appendix.

The first chapter has the rather strange title “Fire”, and contains seven sections dealing with the basic principles of inorganic and organic chemistry, such as the concepts of the atom and elements. The student learns something about phase equilibria and phase diagrams, the chemical bond and its structure, and chemical reactions and equilibria. The chapter also gives a good survey of applications, including, for example, determining the age of minerals from the relative abundances of radioactive isotopes for certain elements, and the age of biological materials from the proportions of the three carbon isotopes. All this is covered at breakneck speed, and sometimes accuracy falls by the wayside as a result: for example, the description of 2,3',4,5,5'-pentachlorobiphenyl is wrong, and a carbon atom with four different groups attached is only one case of chirality in organic compounds. Unfortunately, this carelessness is a general fault of the book. How did the authors arrive at the rather strange dumbbell representation of p-orbitals?

In the chapter on “Earth”, the reader learns about important rocks and minerals in the earth's mantle, including the different silicate minerals, the difference between eruptive and sedimentary rocks, and also metamorphic rocks. That is followed by a short survey of soil and soil contamination, and the three types of weathering of rocks.

In the chapter on “Water”, the student learns about all the important

phenomena of the chemistry of aqueous systems, such as the pH-value, acid and base strengths, and redox reactions. Here there is also a short subchapter on water pollution, but organic pollutants are not covered.

Finally, in the chapter on “Air”, the student learns about the relationships that influence the composition of the atmosphere, including trace gases and important gas-phase reactions, for example those that cause depletion of the ozone layer. Currently important themes such as global warming by the greenhouse effect, and the causes and effects of air pollution, in the particular case of Great Britain, are discussed.

I recommend the book for first-year students of geosciences, although with some reservations. It provides students with a relatively easy way of learning about the subject, but later in their course they must cover the ground more thoroughly by using a more detailed book, such as one of the textbooks by Atkins. The fundamentals of physical chemistry are only treated in a rudimentary way, with the exception of phase diagrams, and also the treatment of organic chemistry is neither sufficiently detailed nor properly presented: some of the structures, for example those of cellulose and of chlorophyll *a*, are incorrect. Perhaps these weaknesses of the book can be remedied in a future edition. Some of the tables of data on aqueous and atmospheric pollution could also be updated.

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