

worked out examples are included. The appendix on mathematical manipulations is thorough. Answers to odd-numbered study questions are at the back of the book.

The Holum text is well illustrated, with many pictures and coloured plates. However, the illustrations in the Forney and Fessenden texts are more than adequate. The figures of Forney's text are in black with shades of grey. Those of the Fessenden and Holum texts are in shades of blue and grey with section headings in blue. The Holum text contains 22 chapters whereas the Forney and Fessenden texts contain 31 and 30 chapters, respectively. The order of chapters and topics are similar with few exceptions. Nuclear chemistry and radioactivity are treated in Chapter 5 by Forney, in Chapter 10 by the Fessendens and in Chapter 22 by Holum. The treatment of electrolytes, body fluids and acid-base balance is presented in the general chemistry unit by Forney whereas these topics are treated in the biochemistry unit by the Fessendens and Holum. The Fessendens have separate chapters on oxidation-reduction reactions, introducing organic chemistry, introducing biochemistry, molecules in three dimensions (optical isomerism), and a chapter entitled Minerals, Vitamins and Drugs. In contrast, Holum and Forney have only the chapter on introducing organic chemistry.

All three texts give a good treatment of the principles of general chemistry, with Fessenden and Fessenden giving the most careful and straightforward presentation. An integral part of many introductory chemistry courses is mathematical problem solving. The Forney and Holum texts give a modest number of mathematical problems. The Fessenden text gives a much more quantitative treatment than the others. Of the three, the Holum text gives the most abbreviated treatment of organic chemistry. All three cover the various principles of biochemistry in a traditional manner.

Throughout these texts relevant examples and applications from the health science fields are described. Forney gives the most applications, with Holum a close second. The Fessendens' use of relevant examples is more judicious and certainly more than adequate.

Outstanding features of these books include the following. Holum's use of up-to-date relevant examples such as clinical charts and a section on radioimmunoassays. The Fessendens' chapter on molecules in three dimensions is excellent. Forney's discussion of several mechanisms of organic chemistry is commendable because it gives students a rationale for predicting products of reactions.

Weaknesses of these texts include the following. Holum gives very few problems concerning the gas laws and he omits a discussion of competitive versus non-competitive inhibition. His treatment of stereochemistry is very brief. The

Fessendens place the chapter on aromatic hydrocarbons near the end of the unit on organic chemistry. Forney does not include any worked out examples on organic nomenclature and writing structural formulae. Her discussion of stereochemistry in the introductory chapter is much too early.

In summary, the Fessenden text is clear and straightforward. It emphasises chemical principles, contains numerous worked out problems and has a modest number of relevant examples from the health sciences. This text is suitable for a course emphasising a traditional chemistry approach. Of the three, the Holum text has the best blend of worked out problems, relevant examples and chemical principles. It would be suitable for a course requiring a

modest degree of mathematical problem solving, a short treatment of organic chemistry and a lot of relevancy. Forney's text is written at a high level and is demanding of the student(s). It would be suitable for a course that emphasises the chemical principles involved in physiological processes and requires only a modest amount of mathematical problem solving. For our two-semester course designed primarily for students in our Nursing Education Program I would prefer the text by Fessenden and Fessenden. □

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Physical chemistry for biologists

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Physical Chemistry and its Biological Applications. By Wallace S. Brey. Pp.589. (Academic: New York, San Francisco and London, 1978.) \$15.95.

SOME, but no detailed knowledge of calculus is required for the study of this text, designed to present the basic principles of physical chemistry with the biologist in mind. The selection of topics is good and the book is easily read. Although the level is elementary, biology majors may find it challenging and it should be considered by instructors who plan to teach at this level.

The first two chapters introduce the kinetic theory of gases, intermolecular forces, Raoult's and Henry's laws, and the colligative properties of solutions. This material expands upon topics usually introduced in first year chemistry courses at about the same level of sophistication. The basic concepts of thermodynamics are presented in the next two chapters. In our opinion these chapters will require much discussion and supplementation by the instructor to impart more than a casual acquaintance with the first and second laws.

A good presentation of the Debye-Huckle theory is given in the chapter on solutions of electrolytes. The elementary algebra of ionisation and titration of weak electrolytes comes next, followed by a

chapter on oxidation and reduction. Biological applications are described mostly in qualitative terms. The electromagnetic and quantum nature of radiation is used to introduce a simple exposition of the photoelectric effect, the Bohr atom, particle spin, and the structure of polyatomic atoms. The chapter on quantum mechanics ends with a presentation of the Schrödinger equation.

The discussion of bonding and molecular spectroscopy is a descriptive overview of these important areas of physical biochemistry. The explanation of covalent bonds is based on the concept of MO, but the LCAO method, although employed in the text, is never explicitly described. Whenever specific examples are used to clarify the introduced concepts (hybridisation of orbitals, electron delocalisation, vibrational spectroscopy) the presentation is clear and helpful. Fluorescence, for all its potential uses in biochemistry, is hardly mentioned. Circular dichroism, though more popular nowadays than ORD, receives less attention than the latter. The qualitative explanation of these techniques is clear, though it lacks somewhat the continuity of presentation.

The chapters on Kinetics of Chemical Reactions and on the Adsorption and Surface Effects are well written. Though brief, these sections focus the attention on areas of great significance. Transport methods and light scattering are described in the chapter on macromolecules. Specific examples or additional illustrations would have helped in giving the students a better feeling for how the actual experiment is conducted, and the data collected and calculated. □

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