

these will be corrected in the next printing. The problems in the latter part of the book are quite routine, of the kind 'verify Eq. 7.8'.

An important topic which has been omitted is the euclidean field theory, which makes contact with the minimization principle of free energy in thermodynamics. I think that it is technically, conceptually and, hence, pedagogically simpler as it deals with real integrals of the type $\int_{-\infty}^{\infty} \exp(-x^2) dx$, and not complex and not absolutely convergent ones like $\int_{-\infty}^{\infty} \exp(-x^2) dx$. Some jargon-free discussions of if and how causality is maintained even with advanced wave solutions in Chapter 8 would have been very useful, and also would have helped the students think about the physical ideas behind the mathematical formalism.

On the whole, the book is a welcome effort to bring good books to Indian physics students at a reasonable price. It is recommended for acquisition by libraries of institutions involved in physics teaching at M Sc or Ph D level, and also by students who want to go a bit beyond the conventional curriculum.

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Laboratory Manual of Organic Chemistry. Raj K. Bansal. Third Edition. Wiley Eastern Limited, New Delhi. 1994, 290 pp. Price: Rs 80.

An author who sets out to write a guide on practical organic chemistry for Indian universities is faced with a choice between two evils. Given the backdrop of a tradition-bound, rigid system (wherein innovation is frowned upon), the book has to meet the demands of the existing (though outmoded) syllabi to make commercial sense for both the author and the publisher, or face oblivion. An innovative guide which sets out to correct the course of practical organic chemistry within this country would have few takers. The bulk of the colleges (over

7000) are nothing more than factories churning out graduates within the rigid norms imposed by the examination systems, that establish a uniformly low level by sticking to the letter (not spirit) of the syllabi. The handful of autonomous colleges/institutions who have the resources to modify and innovate either do not have an undergraduate programme or have chartered their own different courses. Writing a book for this miniscule market makes no commercial sense. Unfortunately, what makes commercial sense has very little professional value. Chemistry being a professional science (which has given birth to several professions and even today continues to churn out new professions) should have a dynamic practical course to prepare students to meet the demands of the present job market and future challenges. One would like to see a practical guide which contains not only classical areas, including spectroscopy, but also a good sprinkling of professional skills such as clinical chemistry (biochemistry), pollution chemistry (air and water monitoring), detection of adulterants in food (forensic science) and some basic industrial chemistry. It should set out a model framework for undergraduate (UG) and postgraduate (PG) courses to make the practical courses relevant to the job market. Alas!! an author who sets forth on this trial would have to wait for the world around him to change, for no publisher would support such a venture.

It is against this background that one should view this book. While Bansal has kept in mind the overall needs of the Indian universities, there are some curious features. It is hard to see why any college would like to store 11.5×40 (students) = 460 g of picric acid prepared every year. Several such preparations appear to be there for old times' sake. The analytical organic chemistry experiments baffle this reviewer. Let us assume 14% nitrogen/sulphur/halogen in a given organic compound. If one takes 2 mg of sodium and an equal quantity of the compound (but does not the grand master A. I. Vogel state that the compound should be added to molten sodium) per ignition tube and 15 ml of water, one could hardly expect 0.02 mg of cyanide/sulphide/halide, assuming 50% reaction (which is impossible under the conditions) Should

one depend on precipitation tests for sulphide? The existence of sulphocyanide in a very dilute alkaline solution is also questionable (if tests are performed as per procedures on pure organic compounds). In the same way, several other functional group tests are also of little practical value. The heavily curtailed list of common organic compounds indicates clearly that the author wishes to weed out items which are seldom given for UG and PG classes. This laudable objective could have been stretched to other procedures such as estimations. The section on organic preparations has several important and useful procedures for classroom work. Considering the financial crunch, the scales of these preparations are generally large. The section on spectroscopy stands alone without connectivity. The cost of organic analysis could be drastically reduced and the training made more realistic to real-world situations by combining classical and spectroscopic approaches. After N, S, halogen test and m. p. determination, the student could analyse the given (photocopy) infrared (IR) spectrum. The functional groups deduced from IR could be confirmed by chemical tests and derivatization. Listing the derivative under different functional groups could send wrong signal to students. For example, the phenolic group is identified by the FeCl_3 test, solubility tests and preparation of a benzoyl derivative. However, an easy derivative for some phenols (and aromatic amines) could be via nuclear bromination. A good derivative for quinol is *p*-quinone, by FeCl_3 oxidation. Some glaring errors in figures and structures in this third edition could have been avoided (e.g. water pump (p. 11), thiourea (p. 142), α -bromo- β -naphthol (p. 158), piperine (p. 236), etc.).

Notwithstanding some drawbacks, the book meets the demands of most of the syllabi. The discussions and procedural details have been trimmed to a minimum to keep the book affordable to students, who should also find the discussions on mechanisms and chemical equations very useful in understanding the procedures. As frequently suggested in the text, the instructor should provide supplementary guidance, bearing in mind that brevity has its own pitfalls. On reduced scales, the experiments on

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named organic reactions would prove to be of good instructional value. Students should find this book affordable and useful for routine laboratory work.

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Perspectives in Nematode Physiology and Biochemistry. M. L. Sood and Jyotika Kapur, eds. Narendra Publishing House, 1417 Kishan Dutt Street, Malivara, Delhi 100 006. 1995. 302 pp. Price: Rs. 575/-, \$ 69.75.

Nematodes, much like insects, are one of the most abundant animals, both in their numerical strength as also in the number of species. While insects are very conspicuous by their presence as also because of some 800,000 known species, the knowledge of nematodes with only about 30,000 known species is very scanty because of their hideous and illusive nature, small size, concealed habitats, colourless bodies and the difficulties that are generally encountered in their collection and isolation. In the last 2 to 3 decades, because of the interest that has been generated due to their economic importance, nematology has fast emerged as an important area of parasitology, helminthology, plant nematology as also that of agricultural and biological sciences. There were not many text/reference books on nematodes until recently, more particularly from India. With this background, in my mind, I naturally was very excited by the mere sight of this book, more so because of its title. But my enthusiasm turned into disappointment as I read through the book.

Keeping in view the paucity of information on the physiology and biochemistry of nematodes, one would have expected some well-knit, properly interlinked, and thoroughly edited write-ups, but what we have in its place are some essays on certain aspects of physiology and a couple of them on biochemistry as well. It is interesting to note that two of these write-ups are by scientists who have not even made any contributions, as judged from the bibli-

ography provided, in the area on which they have contributed the articles. Some other topics like 'Test parasites and nematicidal drugs', though of significance and academic interest, do not actually strictly fall under the title of the book. Similarly, the article on *Ascaridia galli* appears more to be a Ph D research topic rather than a review article and the same should merit publication in a journal rather than in this book. However, from these remarks it should not be inferred that the book does not have merits and the information contained therein is totally devoid of value and utility. The articles by Bone, Boczone, Srivastava and Batra, Harnett and Parkhouse, etc., are exhaustive, up-to-date and praiseworthy.

I feel that the editors have missed a great opportunity of producing a useful book on such a challenging subject. The choice of topics should have been a more careful one. It also appears that the various contributors did not get proper guidelines from the editors and as a consequence the various write-ups do not appear to be the parts of the same book. It is also strange that no detailed introduction or preface precedes the articles. The quality of printing and the general get-up of the book is satisfactory. There are some typographical and printing errors, which should have been avoided.

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Ocean Technology – Perspectives. Sushil Kumar, Vikram V. Agadi, M. Keshava Das, B. N. Desai, eds. CSIR, New Delhi. 1994. 989 pp.

The International Indian Ocean Expedition of 1960–65 was the first attempt in the country towards systematic studies of the seas around India – culminating in the establishment of the National Institute of Oceanography (NIO) at Goa, which has since been in the forefront of oceanographic research in the country. Besides NIO, research in ocean science and engineering is carried out in more than a dozen research institutes, IITs and universities. A glimpse of the contemporary work in the country in ocean technology is given in the book under review. The book is a compilation

of 95 papers presented at a national symposium organized by NIO in August 1992 as a part of the CSIR Golden Jubilee Celebration, to which it is a fitting tribute.

As the title of the book indicates, more than 80 papers deal with different topics in ocean technology and the remainder with ocean science, except for one odd paper on wave propagation in alkaline metals, which is not relevant to the theme of the book. It would have been convenient to the reader, if the editors had grouped the papers under different subheadings. On a study of the book, the following topics can be identified with more than 4 papers in each: ocean waves, wave forces, ocean bed surveys, oil field development, remote sensing, corrosion and biofouling, pollution monitoring and control, biotechnology, deep-sea mining and marine instrumentation. On about a dozen other topics of oceanography, there are one or two papers each. A glaring omission is the subject of deriving electrical energy from the oceans (on which at least three agencies have been working in this country), except for a single paper and that too on the concept of an ocean-coupled solar pond for conversion of thermal energy into electrical power.

There are four papers on marine survey systems and techniques – the very first paper on survey for engineering applications, two papers on the multi-beam sonar for seabed mapping and a review paper on current trends in underwater operations and tools used.

A wide variety of problems related to the design and performance of coastal and offshore structures, guyed towers, tension leg platforms and moored buoys in the presence of ocean waves and currents is discussed in over twenty articles, which will be of immense use to a designer. Four papers which deal with techniques of wave measurements, wave modelling taking into account transformation processes in shallow waters, will be useful in estimating the design wave parameters. A paper on tidal currents in shelf regions deals exhaustively with both theory and practical measurements.

The problem of corrosion in cement, concrete and steel structures in marine environment as well as techniques of studying the corrosion process and corrosion fatigue in metals and biofouling in power plants are discussed in six articles, and will be valuable to engineers.