

A Collection of Interesting General Chemistry Experiments. Anil J. Elias. Universities Press (India) Pvt. Ltd., 3-5-819 Hyderguda, Hyderabad 500 029. 2002. 132 pp. Price: Rs 95.

Although everyone spends money in buying newly published books, there are times when one also receives a complimentary copy of a new book directly either from the author or the publisher. Sometimes such books attract more attention than the books on which you have spent money. One such pleasant experience was receiving a copy of the book under review a few weeks ago from the author Anil Jacob Elias. Since, like the author himself, I also deal with a large number of inquisitive undergraduate engineering students in the chemistry laboratory, I thought it is appropriate to review this book.

The last published well-known book on general chemistry experiments aimed at undergraduate engineering students was in 1967 (Rao, C. N. R. and Agarwala, U. C., East-West Press). It is really nice to see a new book on general chemistry experiments after all these years, especially when we are in the process of upgrading all the RECs to NITs, and when there is need for a strong common laboratory curriculum in chemistry.

This book begins with a foreword from Herbert Roesky (a celebrated chemist and author of the bestseller *Chemical Curiosities*), who states that working with this book will be a great pleasure and success for every teacher who wants to motivate interested and talented students. The twenty experiments described in the book cover almost the whole spectrum of chemistry, although it appears to me that several experiments have a leaning on analytical chemistry (of course, it is expected!). Some of the experiments described in this book are really modern and are not commonplace even in many of the IITs. For example, experiment 1 on extraction of DNA from green peas and onion, and experiment 2 on preparation of superabsorbent polymer will easily arouse interest among the non-major chemistry students. Experiments 3–8 can be easily classified under preparation and estimation of inorganic compounds, where

the student will be exposed to a number of estimation techniques such as complexometry, permanganometry, spectrophotometry, gravimetry and iodometry.

The organic chemistry experiments, which are grouped together (experiments 9–12), have a good variety. While experiments 9 and 10 describe the synthesis of a dye and a chemiluminescent molecule, experiment 11 describes the extraction of caffeine from tea leaves using at least three different procedures. Experiment 12 is the classical Diels–Alder reaction between anthracene and maleic anhydride. Experiments 13–20 include physical chemistry experiments such as determination activation energy of a reaction, determination of partition coefficient, and kinetics of a chemical reaction along with very attractive experiments such as ‘preparation of potash alum from scrap aluminium’, ‘paper and column chromatography of plant pigments’, and ‘aspirin synthesis: conventional and microwave assistance’.

The success of this book is not in the selection of the experiments, but in presenting them in an attractive and lucid manner. Each experiment begins with details such as chemicals and glassware required, time needed to complete the experiment (this is useful for students as well as laboratory assistants in managing the available time), and key literature references. This is immediately followed by *principles* of the experiment. It is really welcome to see that the author has used most number of pages in the book to describe the principles behind each experiment for which he has liberally used illustrations, schemes, tables and box-items. I particularly found the box-items on ‘uses of superabsorbent polymers (experiment 2)’, ‘symptoms and treatment of kidney stones’ (experiment 5), and ‘composition of Coca-Cola and Pepsi Cola’ (experiment 8) not only useful but also equally interesting. The final section in each chapter gives the procedure for performing the experiments. Unlike several old textbooks and manuals, the experimental procedure is listed point by point, and not in the form of an essay. Where alternative procedures are possible, a separate section for the same has been provided. Thus each chapter or experiment in this book is complete in every sense. To put it in simple terms,

this effort of Anil Elias has resulted in a *complete book for undergraduate chemistry laboratory* and not just a laboratory manual. The section on laboratory safety and annexes on solution preparation and procurement of chemicals from local suppliers are added attractions in this book.

There are a few points which the author might want to consider before bringing out the second edition of this book: (1) The scope of this book could be made a bit more broader so that the BSc students (both major and ancillary) can also be prescribed this book. (2) It is useful to print the precautions to be taken for individual experiments in boldface and also add a small section on how to dispose the final material and the solvents used. (3) There are very few experiments on physical chemistry and none on electrochemistry. It is my feeling that, as more teachers/students start using this book, the author may receive similar feedback asking him to introduce or strengthen some aspects. A prudent consideration of such feedback should aid in further broadening the usage of this book.

Educators often feel that the textbooks published in India are of substandard because of the un-upgraded and irrelevant material they contain, along with several factual and typographical errors. In this respect, Anil Elias’s book definitely proves to be different; it is error-free, unbelievably affordable, futuristic, interesting and maintains the strictest of quality. Universities Press has done an excellent job in editing, cover-page design and layout; but if the quality of paper used was better, it would have been easily mistaken for a book published by an international publisher.

At Rs 95 per copy, this book is affordable by students and teachers. I strongly feel that the chemistry departments in various IITs, NITs, universities, and colleges should recommend this book as a standard text for their undergraduate programme.

R. MURUGAVEL

*Department of Chemistry,
Indian Institute of Technology Bombay,
Powai,
Mumbai 400 076, India
e-mail: rmv@iitb.ac.in*