authorities on amino acid metabolism. No hint is given concerning the origin, fundamental characteristics, or intended purposes of the drawings of amino acid crystals reproduced in Chapter I. Important references to the literature have been omitted particularly in Chapters III, IV, and V. An essential amino acid is one required for nomal growth according to the definition on page 225. What is normal growth? Hegsted [*J. Biol. Chem.*, **156,** 247 (1944)] has defined an essential amino acid as one essential for life. Our views on this subject need clarification. Peptides, enzymes, physical properties of the amino acids, amino acid periodicity in proteins, structural models of protein molecules, microbiological assay of amino acids, and other topics have been neglected or have been treated too briefly. A summary of Pirie's [*Biol. Rev.*, **15,** 64 (1940)] views on the criteria of purity of large molecules of biological origin would be an appropriate addition to the discussion on page 64. The chapter on protein structure could be expanded with profit if the author were to emphasize more strongly some of his views ["Advances in Enzymology," **1941,** Vol. I, p. 1].

This book has numerous commendable features including excellent printing, freedom from typographical errors, well-chosen subject matter, and a pleasing style. On the whole it should meet the needs of beginning students better than any other available book.

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THE ANALYTICAL CHEMISTRY OF INDUSTRIAL POISONS, HAZARDS AND SOLVENTS. *Morris B. Jacobs,* Senior Chemist, Department of Health, City of New York, 1928—; Director of Gas Reconnaissance, Gas Defense Service, New York City; Citizens Defense Corps. Second Revised Reprint. Interscience Publishers, Inc., New York, 1944. xvii + 661 pp. 110 figs. 34 tables. 15 × 23 cm. $7.00.

This text was originally issued in 1941 and evidently met so cordial a welcome that this 1944 reprinting was required. Any changes are so minor that the author did not deem it necessary to include an additional preface. Consequently, the reviews of the earlier issue are still applicable. Excellent detailed discussions were given by H. B. Elkins, *Journal of the American Chemical Society,* **63,** 3544 (1941); N. M. Molnar, *Chemical and Engineering News,* **20,** 55 (1942); H. E. Cox, *The Analyst,* **66,** 477 (1941); M. G. Mellon, THIS JOURNAL, **19,** 50 (1942). Reviews of this reprinting have been published by H. H. Schrenk, *Journal of the American Chemical Society,* **66,** 1993 (1944) and again by H. E. Cox, *The Analyst,* **70,** 36 (1945).

Under these circumstances, the present reviewer feels that his competent predecessors have done his work for him. He, too, has found here a wealth of information gathered together, for the first time, from widely scattered sources, especially periodicals and government bulletins. The preface states: "The author hopes that this book will be a contribution to analytical chemistry in industrial hygiene. It should be useful in industry, insurance, education, governmental regulation, research, hospitals, and for chemists, toxicologists, and physicians." The reviewer hopes that it may be seen by students also, because they can read here how to attack and solve problems that require the sampling of dusts and atmospheres, and the subsequent determination of their burden of toxic materials. Practically nothing is given relative to the chemistry of the various procedures, so that considerable reading, class discussions, and lectures would be required to adapt the text to pedagogical purposes.

The scope of the text is indicated by the following partial synopsis: Sampling (25 pp.); Measurement of Gas Volume and Quantity (23 pp.); Absorbers and Absorbents (21 pp.); Chemical and Microscopic Estimation of Dust (44 pp.); Chemical and Microscopic Estimation of Silica (25 pp.); Dangerous Metals [Pb, Hg, As] (44 pp.); Other Harmful Metals [Cr, Sb, Cd, Mn, Se, Va, Tl, Zn, Cu, Sn, Ni, Alkalies, Radioactive substances] (35 pp.); Other Poisonous Compounds [H_2SO_4, SO_2, H_2S, CS_2, S_2Cl_2, $SOCl_2$, SO_2Cl_2, COS, P, PCl_3, Nitrogen oxides, NH_3, O_3] (51 pp.); Poisonous Compounds of the Halogens (20 pp.); Carbon Monoxide and Dioxide, Hydrocyanic Acid, Cyanogen (40 pp.); Combustible and Solvent Vapors (20 pp.); Organic Compounds [about 100 varieties] (195 pp.).

The more important materials are discussed in considerable detail as to: (*a*) industrial incidence, (*b*) physiological response and toxicity, (*c*) detection and estimation. The analytical procedures are taken from the original sources without critical comment or suggested preferences. No information regarding antidotes or treatments is given. There are numerous references to the literature. The final chapter (40 pp.) is devoted to chemical warfare agents. The appendix contains a number of useful tables in which are assembled data on limits of inflammability and explosive ranges, physiological responses, probable safe concentration limits of exposure to gases.

The mechanical make-up of the book is attractive. This text is a good buy.

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ANHYDROUS ALUMINUM CHLORIDE IN ORGANIC CHEMISTRY. *Charles Allen Thomas,* Central Research Director, Monsanto Chemical Company, in collaboration with *Mary Baluk Moshier, Herbert E. Morris,* and *Ross W. Moshier,* Thomas and Hochwalt Laboratories, Monsanto Chemical Company. American Chemical Society Monograph Series. Reinhold Publishing Corporation, New York, 1941. xiii + 972 pp. 15.5 × 23.5 cm. $15.

After a short introduction and historical sketch of Friedel and Crafts, a chapter is devoted to the chemical and physical properties of anhydrous aluminum chloride itself and another to the various mechanisms which have been proposed to explain its role in organic reactions. The next 12 chapters, which constitute the major portion of the book, give a detailed and orderly account of the numerous reported instances of the use of aluminum chloride in reactions involving aromatic compounds. The literature of the more recent and less well-known field of the use of aluminum chloride in aliphatic reactions is then surveyed with separate sections on polymerization and cracking. The two final chapters are devoted to the manufacture and purification of anhydrous aluminum chloride and to the various factors, such as temperature, solvents, agitation, etc., which may modify its action. Subject, author, and patent indexes complete the book.

There can be little doubt that the authors have achieved to a commendable extent their expressed purpose of collecting in one place all of the widely scattered literature on the use of anhydrous aluminum chloride in organic chemistry. However, in achieving this completeness as a literature survey, the authors have denied themselves, for the most part, the opportunity of critically evaluating the work cited. As a consequence, the book will be particularly useful to workers in the field of reactions involving the use of aluminum chloride, but in its very completeness will overwhelm those of more casual interest. Likewise, it will be useful to advanced students as a reference work but will not readily lend itself to use as a textbook.

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ORGANIC CHEMISTRY. *Louis F. Fieser* and *Mary Fieser.* Abridged edition. D. C. Heath and Company, Boston. 1944. xi + 698 pp. 22 figs. 61 tables. 20 charts. 15.5 × 23.5 cm. $4.00.

It is always pleasant when first good impressions continue throughout the reading of a book. Such were the feelings of the reviewer as he turned the pages of this admirable book. It is an abridged edition of the larger work by the same authors but the abridgment has been done so well that even one familiar with the first work would not especially notice the condensation. The abridged edition consists of 33 chapters instead of 40 and of 698