

Book review

Toxic Organic Chemicals: Destruction and Waste Treatment by E. Ellsworth Hackman III, No. 40 in Pollution Technology Review Series, xiv + 317 pp., Noyes Data Corporation, Park Ridge, New Jersey, 1978, \$42.

The presentation of this volume is rather different from that of most of the other volumes in this series known to the present reviewer. Thus the page size is almost exactly A4, the text is presented in a double column format and, for the most part, is printed in a large and clear type. The increased page size allows for easier assimilation of the mass of tabulated information and comprehension of the flow charts and diagrams presented. The style of presentation adopted for the main text also represents a real improvement for the user over that commonly used previously in this valuable series of publications in that a flowing narrative style is adopted, coupled with graphical and tabular presentation of detail, rather than the more difficult to read texts, consisting often of extracts from patents, offered to us before.

The scope of the text extends over organic material but excludes organo-metallics. The major portion (Part II) of the book is concerned with “toxic” organic waste generated by pesticide production, general organic chemicals production, petroleum refining, textiles manufacture, plastics and polymer production and coal conversion. Part I deals with more general topics such as a review of the current US legislation and its consequences, particularly with respect to effluent disposal. An attempt is made to define ‘toxic’ with reference to various official US agencies such as NIOSH, OSHA and the USEPA. About 50 pages are then devoted to a discussion of various methods for the treatment of toxic wastes, e.g. microbiological methods, oxidation using air, oxygen, ozone, photo-oxidation, hydrogen peroxide, potassium permanganate, chlorine dioxide and electro-oxidation. Only six pages are devoted to a rather general discussion of thermal methods of toxic waste treatment and this section is completed by a brief discussion of the use of high energy radiation in waste treatment. Forty-eight pages are devoted to descriptions of various physical separation techniques for the removal of gases and solids from gaseous waste streams and the removal of solids from liquid effluent.

In Part II the methods it is thought necessary to use if the US legislative requirements are to be met for the various industries already mentioned are outlined with the varied requirements for “Best Practicable Control Technology Currently Available” and “Best Available Technology Economically Achievable” being discussed in some detail. Since these standards of performance are high, and controversial, the methods suggested are typically more complex and expensive than is presently thought necessary in the UK in many cases. Treatment of effluents contaminated by modest amounts of organic materials using activated sludge processes gets comparatively little

discussion in any detail but is widely practiced. However, it is, of course, true that many texts exist on activated sludge processes and the exclusion of detailed discussion here is perhaps not important.

The section on incineration I found disappointing. This subject is worthy of an extensive section in its own right. Incineration of toxic waste is often recommended lightly, as if it were easy. It isn't easy; handling toxic materials prior to combustion needs care, combustion conditions must be chosen that will actually oxidise the waste completely without discharging unknown and perhaps harmful combustion products to the atmosphere. The 4 or 5 pages devoted to incineration here is not adequate, and in my opinion should either have been considerably expanded — or omitted altogether.

The book is to a very large extent based on US practice, and in particular much use is made of the USEPA's Development Guideline Documents for Effluent Standards for various industrial sectors. This will, I believe, to a slight extent, reduce its value to non-US readers, but the mass of valuable data presented far outweighs this small drawback.

However, I must reiterate my major criticism of this whole series of books, and this concerns the lack of an index. With many of the other books in the series the nuisance of not having an index was to some extent overcome by giving a comprehensive statement of the contents of the book. This text also has an extensive listing of its contents. Unfortunately this is almost entirely arranged by treatment method rather than by the substance to be treated, and comparatively few materials are specifically mentioned in the contents list. For example, the reader will have no clue that much of the extensive discussion on oxidation as a treatment method is supported by extensive, and interesting data relating to phenol oxidation by various reagents. No doubt the inclusion of an index would increase the price and also slow down the rapid rate of publication for which Noyes have an enviable reputation — this book for example includes references to 1977 literature — but I feel that the lack of an index in this particular volume is particularly unfortunate and must reduce the useability of this book which otherwise would, I believe, be read with profit by anyone involved in industrial waste treatment.

E.E. FINNECY

Erratum

Journal of Hazardous Materials, 2 (1977/78) 393.

The price of *Treatment of Industrial Effluents* should read £ 7.95, and not \$ 7.95.