

For some reason, the chapters dealing with a general treatment of catalyst supports are interspersed between chapters dealing with specific supports. The advantages of this approach are not quite clear to me. An interesting contribution discusses the interrelationships between granule strength, pore size, pore volume, and density, and ways of controlling these parameters; however, few quantitative details are given, and there are few references cited to help the reader in this regard. The chapter on spillover contains a good treatment of the behavior of different oxides with respect to this phenomenon. It also deals with SMSI as a subset of this phenomenon. In the concluding section of this chapter, partial oxidation is treated as an example of oxygen spillover: an interesting approach, which could stand further elaboration in the text.

The book suffers from a number of small annoyances to be expected in multi-contributor texts. References are inconsistent from chapter to chapter, there are minor inconsistencies in separate chapters, and often opportunities are lost in not cross-referencing material from one chapter to an earlier or later one. Nevertheless, Professor Stiles and his contributors are to be congratulated on attempting a book of this breadth and scope. To a significant extent, it may be said that they have succeeded.

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Filtration

By Michael J. Matterson and Clyde Orr,
Eds., Marcel Dekker, Inc., 1987, 760 pp.,
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other countries)

As a revision of an earlier publication first out in 1977 about various aspects of filtration; this present volume incorporates significant changes and additions. It follows a format used earlier, which is a compilation of a number of chapters written by experts dealing with various filtra-

tion topics. The editors selected the topics generically (for example, air filtration, liquid filtration, etc.) and according to the nature of the application (for example, filtration in the chemical industry, filtration in the mineral industry, etc.). While this format may be an easy way to meet the needs of practical filtration engineers and those interested in more fundamental aspects of filtration, subject coverage in certain instances becomes repetitive. For example, flow through porous media and the Carmen-Kozeny equation are considered in no fewer than six places, with slightly different notations used each time. While this approach may not be a serious flaw in itself, the result is annoying and may represent a waste of useful space.

Further, the chapter on liquid filtration is very sketchy and lacks depth. Theoretical discussions are limited to cake filtration; there is hardly any mention of deep-bed filtration. With cake filtration, the level of discussion has not gone beyond what appears in any introductory unit operation text (for example, see McCabe, Smith and Harriott, *Unit Operations of Chemical Engineering*, 4th Ed., McGraw-Hill).

The chapter on air filtration is also disappointing. It is heavily biased in favor of fibrous filtration with only a perfunctory discussion of fabric or granular filtration. This emphasis is understandable since earlier work in aerosol filtration originated from World War I gas-warfare experiences. The need in those early days was for developing fail-proof masks. This limited view, however, no longer corresponds to the present where fabric filtration (baghouse filters, for example) and, to a lesser degree, granular filtration are increasingly applied to industrial processes.

More important than the bias, though, is the fact that the chapter on air filtration suffers from certain omissions and factual errors. Since the work was purported to be extensively revised, one ex-

pects it to include a substantial amount of recent research results. A casual check indicates that of the four hundred references cited, fewer than thirty appeared in the literature after 1977. This imbalance is rather surprising if one considers the popularity of aerosol filtration during the past decade. In the area of collection efficiency resulting from diffusion in fibrous filtration there are omissions and errors. The author devotes considerable space to its discussion but nowhere mentions the work of Lee and Liu (*Aerosol Sci. & Technol.*, 1, 35, 147, 1982), which is now regarded as the definitive work on fibrous filtration at least in this country. Another example concerns the discussions of granular filtration (p. 103). True, a number of references were cited (*AIChE J.*, 19, 58, 1973; 20, 889, 900, 1974; *J. Colloid Interface Sci.*, 43, 350, 1973; 49, 320, 1974). But all these references deal with hydrosol filtration, not air filtration.

The two chapters on industrial air filtration and filtration in the chemical industry (which is concerned only with liquid filtration) are very good. Both chapters are well-balanced between theory and practice. They provide useful information in both areas. The latter chapter is particularly strong, so strong, that it makes Chapter V superfluous. The compilation and tabulation of the porosities and specific cake resistance of various systems studied so far (Tables 6, 7, 8, on pages 330-333, 338-339) should prove extremely useful to design engineers.

The remaining chapters provide useful data on current practices related to various aspects of filtration operation, including filter media, high-efficiency air filtration, analytical application, etc.

This volume is a useful reference on filtration, but not the invaluable work one is led to expect after reading the publisher's press release.

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