

the greatest value of his participation was characterized in a comment of a student to me: "I really busted a gut on the project so as not to embarrass the Department and you in the eyes of Mr. Kennedy."

Educators are always deeply appreciative of a willingness by people from industry to get involved in working with students. The author particularly valued this investment by Mr. Kennedy and Gulf toward instruction in a subject so foreign to universities. □

REFERENCES

- Baba, T. R. and Kennedy, J. R., "Ethylene and Its Coproducts: The New Economics," *Chem. Engr.*, V83, No. 1, 116-128 (1976).
Tribus, M., "Rational Descriptions, Decisions and Designs," Pergamon Press, Elmsford, New York, 1969, p. xv.

ChE book reviews

FILTRATION: PRINCIPLES AND PRACTICES (TWO PARTS),

Part I. Chemical Processing and Engineering Series, Volume 10

Clyde Orr, Ed.

Marcel Dekker, 1977. 544 pp. \$45.00

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Filtration is one of the most neglected areas of chemical engineering. This is the consequence of the fact that it is not based on a sound theoretical basis and is an art rather than a science. Other areas, such as heat and mass transfer, receive much more attention because of their sound theoretical basis.

Although this book attempts "to cover theory as well as the practical considerations that enter into actual applications," it does not achieve its purpose. It also suffers a lack of careful organization, common nomenclature and format.

In Chapter 1, Gas Filtration Theory is covered extensively with numerous references (462 to be exact!). Contrary to the other chapters of the book, it does not have a notation section at the end. It is possible to combine this Chapter with Chapter 4, Industrial Gas Filtration.

Chapter 2, Liquid Filtration Theory and Filtration Pretreatment, and Chapter 5, Filtration in the Chemical Process Industry, basically cover

the same area and most of the equations are repeated twice. Notation is not consistent, for example, mass fraction of solids in the slurry is denoted by c and s in Chapters 2 and 5, respectively. From the reader's point of view, some statements are contradictory. For example, in Chapter 2, the value of B is claimed to vary between 0 to 0.25 (p. 189) but in Table 7 (p. 400) of Chapter 5, the general range of B is given to be 0.1 and 0.5. Also the flow direction in Figure 21 of Chapter 5 is not correct.

In Chapter 2, which is attributed to Professor Tiller, the basic flow equation for compressible sludges (Eq. 41) is discussed and the Kozeny-Carman equation is substituted for the permeability term. This latter substitution is subject to conjecture since in a recent article [*Filt. & Sep.*, 14, 122 (1977)] Professor Tiller claims that the Kozeny-Carman Equation cannot be used to describe compressible cakes behavior.

In Chapters 2 and 5, the solids movement within the filter cake is neglected in order to avoid the use of a "sophisticated" form of Darcy's law for the development of filtration theory. If the solids velocity is zero, then, according to the equation of continuity, porosity at any point is independent of time and the superficial liquid velocity is constant throughout the filter cake at any instant. But, according to Equation (72) of Chapter 5, which was derived on the basis of no solids velocity in the filter cake, porosity at any point is a function of time which is, of course, a contradiction.

Recently, it has been observed that there are a number of serious problems in the compression-permeability test cell (CPTC) methodology which leads one to question the ability of this device to accurately and, more importantly, to uniquely simulate a constant pressure filtration. In one of his articles [*AIChEJ* 15, 405 (1969)], Professor Shirato stated that ". . . most data found in the literature have not taken wall friction into account and consequently do not yield strictly accurate values." Although almost all the figures in Chapter 5 are from data based on CPTC observations from the papers of Professor Tiller and Professor Shirato published over the past two decades, the problem with compression-permeability test cell data is never mentioned.

The rest of the book deals with the Filter Media, Chapter 3, and Ultrafiltration, Chapter 6.

The price of the book is far too expensive! □