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Chemical Engineering Journal 73 (1999) 261–264

Chemical
Engineering
Journal

Book reviews

Rules of Thumb for Chemical Engineers — A Manual of Quick, Accurate Solutions to Everyday Process Engineering Problems. Carl Branan, Gulf Publishing Company, Houston, TX, 2nd edn., 1998, 418 pp., US\$ 79 (£64) (soft-back), ISBN 0-88415-788-1.

The more I read this book, the more I like it.

The first thing that strikes you is the consistent use of US units. Until recently I would have expressed surprise about that. However, I now work in the USA myself and have experienced that US-units are still the norm here in actual chemical engineering practice, certainly in plant operation and design. As the book aims at practising chemical engineers and it is published in the US, it has probably not even crossed the author's mind to use metric units. It does, however, make the book less appealing to non-US colleagues: How inconvenient: rules of thumb all in the 'wrong' units!

The title 'Rules of Thumb' should appeal to any practising Chemical (Process) Engineer. However, the book is more than just rules of thumb. Its aim is to have neatly put together practical, 'how-to' methods, with just a bare minimum of the theory presented and without justifying 'why' the rule of thumb works. Presumably the underlying reasoning is that a practicing engineer already knows or knew the theory or where to find it. For daily problem solving he/she just wants to quickly get and use a suitable method, correlation, or formula. Surely we have all experienced how much time it can take to find that one correlation in, say, Perry or Coulson and Richardson because these invaluable books do present a lot of 'textbook' theory, which we do not always want to go through. So, that is why I would want this book on my shelf in between these two classics.

However, the author/editor Carl Branan (only very few sections were written by guest authors) did not always stick to the aim described above. On a number of topics the book takes more the Perry/Coulson and Richardson approach and why would I want another Perry? Well, even in those more elaborate sections, the book has a very pragmatic approach and shares with us Mr. Branan's experience. The book is full of 'that's the reality in practice' type of 'little' things not mentioned in other books, and that those of us who actually work in operations/design have to learn ourselves, frequently the hard way. This makes the book both valuable to senior engineers and fresh-from-college graduates starting in plant technology who can thus exploit the wealth of

experience of Mr. Branan, who has worked for 40 years in process design and troubleshooting in oil, chemicals and gas.

The book consists of four sections: Equipment Design, Process Design, Plant Design and Operations. However, the split between the first two sections is rather arbitrary. Especially the first section is full of to-the-point 'how-to's and probably the main reason for wanting to have this book in the first place. Nearly all major and some minor unit-operations are covered, with the notable exception of my personal favorite piece of equipment: the reactor. I am not sure of the reason for this, because I could easily conjure up a number of useful rules of thumb for reactor design and operation. Also mixing and mixers are hardly covered (in the section 'blending'!). Fractionation on the other hand is treated quite extensively, reflecting the author's wide experience in this field. That is probably also why in the section Process Design there is a separate chapter on Gas Treating, which I felt is too superficial for those who work in Gas Treating and not relevant for those who do not.

Very good are the numerous handy selection guide tables. Even though in many companies the selection of, for example, the details of heat exchangers (fixed tube sheet, floating head, U-tube, kettle, etc.) will be done by a specialist who probably has his own table, it does give you a good overview of what is important and how that might affect the costs/operation.

The second part of the book is more descriptive. The rather extensive section Process Evaluation would not have been misplaced in the recent edition of Ullmann. Here a few more practical formulae would have been useful, along with a reference to modern tools like QUESTIMATE, ICARUS 2000, IPE, which can be used in combination with flow-sheeting programs to generate capital investment estimates.

I particularly liked the section on troubleshooting, which is loaded with suggestions and common causes, even though the examples are – by necessity – chosen rather randomly. The fractionation troubleshooting is, I think, very valuable for every plant technologist dealing with distillation columns when the plant calls "Houston, we have a problem".

All in all, a very recommended book which contains far more than just 'rules of thumb'.

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PII: S1385-8947(99)00066-2