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REVIEW

Dominic Foo (ed.): Chemical Engineering Process Simulation

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This book, which is published by Elsevier, was a joint effort of Dominic Foo, Nishanth Chemmangattuvalappil, Denny Ng, Rafil Elyas, Cheng-Liang Chen, Rene Elms, Hao-Yeh Lee, I-Lung Chien, Siewhui Chong, Chien Hwa Chong, and 6 other contributors. It consists of 17 chapters which can be broadly divided into two main parts: (1) foundations of process simulation and (2) various simulation packages. The first part consists of four chapters which discuss the fundamentals of process simulation and provide an overview of the common principles implemented in simulation packages. A chapter has been dedicated to the registration of new components which are often encountered for substances which are not included in the software databases. A recap of thermodynamic and chemical principles is then discussed to illustrate the underlying assumptions and calculations performed in simulation packages to obtain process parameters, stream compositions, and physical property estimations. The first part then concludes with a discussion of how recycle streams are simulated.

The remaining 13 chapters on the other hand are distributed to discuss four of the more common simulation packages being utilized by academics and practitioners. These four simulation packages consist of Unisim Design from Honeywell, PRO/II by Schneider Electric, Promax by Bryan Research and Engineering, and Aspen HYSYS by Aspentech.

Several chapters have been dedicated for each simulation package with a chapter devoted to a preliminary tutorial. The tutorial is done by going through an initial example focusing on the production of *n*-octane. The step-by-step procedure for setting up the model follows four phases: (1) the basic simulation setup; (2) the reactor system; (3) modeling the separation units; and (4) modeling the recycle system. The book provides illustrations which clearly show how the user should interact with and navigate through the software package using the interface. The same motivating example is used to introduce the different simulation packages. This has the advantage of having readers see the main differences and similarities that exist between the packages. Succeeding chapters for each simulation package provide additional case studies which include a propane refrigeration cycle, modeling for biomaterial processing, sour gas sweetening, vinyl chloride monomer production, acrylic acid production, reactive distillation processes, azeotropic distillation systems, heat exchanger networks, and steam power plants. These case studies further demonstrate additional capabilities of the simulation packages. Each chapter then ends with some exercises which the reader can use to further explore the software, followed by a list of related references for further reading.

One thing that seems to be lacking is a concluding chapter for the book which puts the different packages side by side to provide a summarizing insight on the advantages and disadvantages of each. It would have been nice to see a guideline which shows which simulation packages would be more applicable for certain types of systems.

In summary, this book provides a good introduction to process simulation and software implementation which seems to be lacking in literature. It is a must read for chemical engineering students, faculty, and practitioners.

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