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Design of separation processes: From the empirical methods to the computer-aided strategies

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In the chemical industry, or in refineries and biorefineries, it is common to find a reactor, or a set of reactors, where reactants are converted into valuable products and by-products. Those mixtures leaving the reaction section must be treated in a separation section to obtain the pure products, also recovering the unreacted raw materials. The design strategies for such systems have considerably changed with the years, varying from merely empirical methods, at the beginnings of production industry, to the modern computer-based methods, which imply the use of modular simulators. In this work, a brief history of the design methodologies for the separation processes will be presented; focusing on distillation columns, since they are the most used separation devices used in industry. The combination of modular simulators and a CFD approach is proposed to obtain reliable designs of distillation systems. Two cases of intensified distillation systems are presented as examples of the proposed approach, namely, a dividing wall distillation column and a reactive distillation column.

Biography

Fernando Israel Gomez-Castro has completed his PhD in Chemical Engineering from the Instituto Tecnológico de Celaya (Celaya Institute of Technology, Mexico). He is a full-time Professor and Director of a research team focusing on synthesis, design and optimization of chemical processes, particularly on conventional and intensified distillation schemes. He has published around 20 papers in reputed journals, 4 chapters and a book, also serving as reviewer for papers and research proposals. His biography has appeared at the 2015 editions of "Who's Who in the World" and "2000 Outstanding Intellectuals of the 21st Century".

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