



# Sustainability in the Design, Synthesis and Analysis of Chemical Engineering Processes

By Gerardo Ruiz Mercado, Heriberto Cabezas

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*Sustainability in the Design, Synthesis and Analysis of Chemical Engineering Processes* is an edited collection of contributions from leaders in their field. It takes a holistic view of sustainability in chemical and process engineering design, and incorporates economic analysis and human dimensions. **Ruiz-Mercado** and **Cabezas** have brought to this book their experience of researching sustainable process design and life cycle sustainability evaluation to assist with development in government, industry and academia.

This book takes a practical, step-by-step approach to designing sustainable plants and processes by starting from chemical engineering fundamentals. This method enables readers to achieve new process design approaches with high influence and less complexity. It will also help to incorporate sustainability at the early stages of project life, and build up multiple systems level perspectives. **Ruiz-Mercado** and **Cabezas'** book is the only book on the market that looks at process sustainability from a chemical engineering fundamentals perspective.

- Improve plants, processes and products with sustainability in mind; from conceptual design to life cycle assessment
- Avoid retro fitting costs by planning for sustainability concerns at the start of the design process
- Link sustainability to the chemical engineering fundamentals

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### Editorial Review

From the Back Cover

*Improve plants, processes and products with sustainability and the chemical engineering fundamentals in mind*

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2. Avoid retrofitting costs by planning for sustainability concerns at the start of the design process
3. Link sustainability to the chemical engineering fundamentals

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About the authors

Gerardo Ruiz Mercado

Chemical Engineer, Sustainable Technology Division, Office of Research and Development (ORD), at the U.S. Environmental Protection Agency (U.S. EPA).

Dr. Ruiz-Mercado is an active member of the American Institute of Chemical Engineers (AIChE), He was a recipient of the Alliance for Graduate Education and the Professoriate (AGEP) fellowship during his graduate studies. Dr. Ruiz-Mercado holds a Ph.D. from the University of Puerto Rico-Mayaguez (2009) and a B.S. (magna cum laude) from the University of Atlántico-Colombia (2002) all in chemical engineering. Before joining the U.S. EPA, Dr. Ruiz-Mercado continued his research studies as a Research Associate in the Department of Chemical Engineering and Bioengineering at the University of Illinois at Chicago.

Heriberto Cabezas

Senior Science Advisor to the Sustainable Technology Division in the Office of Research and Development (ORD), at the U.S. Environmental Protection Agency (U.S. EPA), and Associate Professor in the Faculty of Information Technology and Bionics at the Peter Pazmany Catholic University in Hungary.

Dr. Cabezas is a former Chair of the Environmental Division of the American Institute of Chemical Engineers (AIChE). He was a recipient of the 2011 Research Excellence Award in Sustainable Engineering from the AIChE, the ORD Sustainability Award (team) at the U.S. EPA, and the 2013 Lawrence K. Cecil Award in Environmental Chemical Engineering from the AIChE. Dr. Cabezas holds a Ph.D. from the University of Florida (1985) in thermodynamics and statistical mechanics, a M.S. from the University of Florida (1981), and a B.S. (magna cum laude) from the New Jersey Institute of Technology (1980) all in chemical engineering. He is a Fellow of the AIChE, a member of the American Association for the Advancement of Science, and a Board Certified Member of the American Academy of Environmental Engineers and Scientists.

#### About the Author

Dr. Ruiz-Mercado is currently leading and developing U.S. EPA research projects in areas of sustainable development for helping society, government, industry, and academia. His experience, published record, and contributions to the advancement of knowledge in research areas such as sustainability evaluation, sustainable process design and life cycle sustainability evaluation, demonstrate his capability to identify new research needs and challenges.

Dr. Cabezas is currently leading and developing U.S. EPA research projects in areas of sustainable development for helping society, government, industry, and academia. His experience, published record, and contributions to the advancement of knowledge in research areas such as sustainability evaluation, sustainable process design and life cycle sustainability evaluation, demonstrate his capability to identify new research needs and challenges.

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