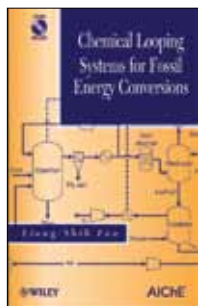


# Books

## CHEMICAL LOOPING SYSTEMS FOR FOSSIL FUEL CONVERSIONS

**Liang-Shih Fan, John Wiley & Sons, Hoboken, NJ, \$100, 420 pages, Oct. 2010, ISBN: 978-0-470-87252-9**



Over the past century, the concept of chemical looping has been widely applied in chemical industries. In coal-based fossil energy systems, for instance, the steam iron process was used commercially from the 1900s to the 1940s, and the carbon dioxide receptor process was demonstrated at the pilot scale in the 1960s and 1970s. However, no chemical looping processes using fossil fuels are in commercial operation today.

With the current emphasis on CO<sub>2</sub> emission control, interest in chemical looping has resurfaced. Chemical looping processes are particularly desirable because of their unique ability to generate a sequestration-ready CO<sub>2</sub> stream. The novel technology involved in chemical looping has the potential to efficiently convert fossil fuels into clean energy.

This book explores the new techniques that have been developed for direct or indirect processing of coal and other carbonaceous feedstocks in chemical looping reactors. It details the fossil fuel conversion procedures that can make these looping processes an effective and economical practice for maximizing natural resource utilization, and offers an in-depth view of the research conducted in this field from a commercial-viability perspective. It also presents a long-term energy strategy that holds the promise of benefiting future generations.

Readers will learn about the fundamentals and applications of chemical looping processes that can be used in the combustion and/or gasification of carbon-based materials such as coal, natural gas, petroleum coke, and biomass. The book also describes the role that science plays in the production of steam, syngas, hydrogen, chemicals, electricity, and liquid fuels, and explains how chemical looping systems are poised to make the leap from the laboratory to real-world commercial applications.

The book also offers references for researchers and educators conducting courses about chemical processes, fossil energy systems, and CO<sub>2</sub>-capture technologies.

Included with the book is a CD that contains the chemical looping simulation files and the simulation results based on the ASPEN Plus software for such reactors as gasifiers, reducers, oxidizers, and combustors, as well as for conventional gasification processes, the syngas chemical looping process, the calcium looping process, and the carbonation-calcination reaction process.

## SUSTAINABILITY IN THE PROCESS INDUSTRY: INTEGRATION AND OPTIMIZATION

**Jirí Klemes, Ferenc Friedler, Igor Bulatov, and Petar Varbanov, McGraw-Hill, New York, NY, \$100, 384 pages, Sept. 2010, ISBN-13: 978-0-07-160554-0**



Recent years have seen an increased interest in the development of renewable, noncarbon-based energy sources. The fluctuations and large increases in the prices of oil and gas have further prompted the industrial sector to look for alternative, lower-carbon (or noncarbon) energy sources.

This book explains the basics of process integration and optimization, and discusses in depth applications for improving the energy and water efficiency of industrial and nonindustrial energy users. Beginning with an assessment of basic energy efficiency, the book then turns to process integration and process optimization, and explores approaches for adapting sustainable methodologies to include the integration of waste and renewable energy sources.

The book includes industrial case studies, as well as details on software tools for process integration, modeling and optimization. It can serve as a useful guide for practitioners throughout the process industries, and for graduate, postgraduate, and continuing education students.

## ECOLOGY OF INDUSTRIAL POLLUTION

**Edited by Lesley C. Batty and Kevin B. Hallberg, Cambridge University Press, New York, NY, \$59, 362 pages, March 2010, ISBN: 978-0-521-73038-9**



Reflecting the content of the 2008 Symposium on the Ecology of Industrial Pollution, held in Birmingham, U.K., this book provides a complete picture of industrial pollution from cause to effect to solution.

Written for researchers and practitioners in environmental pollution, management and ecology, the book brings together diverse viewpoints from academia, industry, and environmental regulatory agencies and regulators, addressing such topics as biological resources of mining areas, biomonitoring of freshwater and marine ecosystems, and risk assessment of contaminated land. Major themes are illustrated using case studies, with chapters arranged in a progression from the main ecological impacts through monitoring techniques and finishing with ecological remediation technologies.