Other - Enabling Process Innovation Through Computation - EPIC

Multiscale Process Engineering (MPE) Concepts in Reaction Engineering Practice

M. P. Dudukovic, Laura and William Jens Professor

EECE Department, Washington University in St. Louis

Patrick F. Taylor Hall 1106
February 21, 2014 - 03:30 pm

Abstract:

The timely transfer of scientific discoveries to commercial practice, in production of fuels, chemicals, materials, pharmaceuticals and in variety of consumer end products, is the domain of process engineering. The developed process technologies always had to be profitable. Expectations for novel processes now include improved efficiencies, minimal environmental footprint and sustainability. Using multiphase reaction engineering as example, in this presentation it is illustrated that the multi-scale process engineering (MPE) concepts provide an effective methodology to accomplish process intensification, increased efficiency, and other desirable attributes of environmentally sound technology. Investment in further development of science based tools for systematic implementation of MPE in scale-up and design is needed but not happening. The old questions regarding widely used reactor types are still being asked today and are addressed by tools of the past century. As a result, the gap between academic research and industrial practice is growing and wider implementation of new science in industrial practice is being delayed. Examples in diverse technologies are provided. The most significant challenge to technology change is not technical in nature but lies in the current global economic, political and business system that is focused exclusively on short term returns. Unless we change that culture the implementation of science based design of innovative “green” process technology may remain elusive.
References: Dudukovic, M.P., 1) Frontiers in Reactor Engineering, Science 325, 698, 2009. 2) Reaction Engineering: Status and Future Challenges, Chem. Eng. Science 65, 31, 2010.

ATTEND ONLINE AT: HTTP://CONNECT.LSU.EDU/EPIC-SEMINARS

Speaker's Bio:

M. P. Dudukovic (B.S. in Chemical Engineering from University of Belgrade, Yugoslavia, and Ph.D. from IIT, Chicago) is the Laura and William Jens Professor in the Department of Energy, Environmental and Chemical Engineering (EECE) at Washington University in St, Louis (WUSTL).

At WUSTL in 1974 he developed the Chemical Reaction Engineering Laboratory (CREL) as a unique and effective interface for transfer of academic reaction engineering to industrial practice. CREL activities focused on two broad areas: development of improved, fundamentally based models for multiphase reaction systems with experimental verification; and extension of reaction engineering methodology to new environmentally benign processes in production of fuels and materials. Over two dozen global companies have been associated with CREL .

Center for Computation & Technology
2003 Digital Media Center • Telephone: +1 225/578-5890 • Fax: +1 225/578-8957