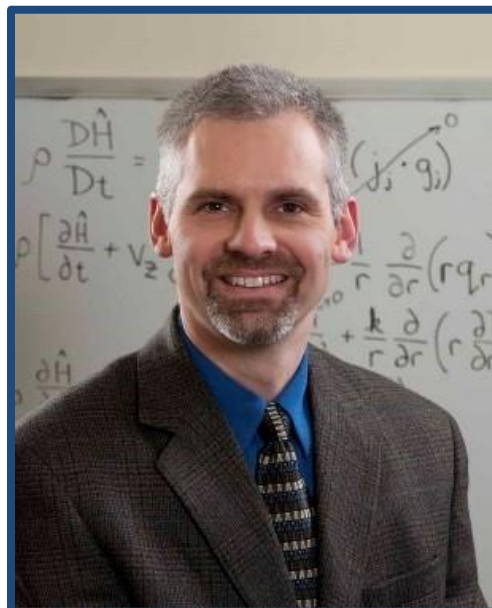


“Chemical Reactor Scale-Up: Principles and Practice at Dow”

Wednesday
October 30, 2019
3:00 pm
Wu and Chen Auditorium
Levine Hall



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Abstract

Since Dow first formed a global reaction engineering discipline over twenty years ago, we have accumulated much experience leading and supporting a diversity of reaction engineering projects for our corporation. This presentation will provide specific examples of real-world reaction engineering problems at Dow in the past 27 years and summarize our perspective regarding the key tools and methods of the well-equipped industrial reaction engineering laboratory. Several brief anecdotal descriptions of past process development and reactor scale-up projects will highlight important lessons learned on this journey. In addition, this talk will demonstrate the role of reaction engineering fundamentals and methodologies in shaping projects, enabling decisions, and empowering teams to succeed. Over the years, we have used a wide array of laboratory hardware and computer software tools. In some cases, we have developed our own tools; in other cases, we have chosen to use commercially available offerings to meet our experimental and computational needs. This presentation will highlight the reaction engineering tools and best practices that have stood the test of time and close with a brief list of some of the capability gaps that remain.

Bio

Dan Hickman is a Fellow in the Reaction Engineering group in the Engineering and Process Science department of Dow's Core Research & Development organization. He received his B.S. in chemical engineering from Iowa State University (1988) and his Ph.D. in chemical engineering from the University of Minnesota (1992) in the field of short contact time catalytic monolith reactors. In his 27 years with Dow, Dan has been a subject matter expert and technical leader in reaction engineering and process development for numerous reaction systems across a variety of Dow businesses and technologies. Dan has led the development of kinetic and reactor models for the scale-up of many developmental and commercial reactor systems, including stirred tank reactors, fixed bed reactors, and fluidized bed reactors. His contributions at Dow include designing reactors for three commercial processes. Dan holds 17 U.S. patents and is an author of 25 journal articles and book chapters and more than 200 internal Dow reports. Dan received the CRE Practice Award from the Catalysis and Reaction Engineering Division of AIChE in 2015.