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Heterogeneous catalysis of complex reaction systems: Case studies from petrochemicals

There are many processes in the general petrochemicals and petroleum processing arena which are characterized by a complex network of reactions, and hence a complex reaction mixture which presents challenges for product workup. While in principle, catalysis presents a possible solution to reduce the complexity of such reactions via a selective promotion of the desired steps in the network, development of appropriate catalysts remains very much an art to this day, if one that is informed by a wealth of experience and some theoretical developments. In this task, we shall discuss some case studies from the petrochemicals and related areas such as biodiesel and automotive catalysis, to illustrate both the possibilities as well as the challenges. Each case study illustrates a separate set of issues. Among the challenges illustrated will be (a) that of selectivity (b) the role of catalyst support (c) synergistic behaviour when catalysts are combined, (d) catalyst activation and deactivation.

Biography

Akkihebbal K Suresh completed his PhD from Monash University. After a brief stint with Hindustan Lever Research Centre (a Unilever company), he joined the Indian Institute of Technology Bombay in 1988 and has been with the Institute ever since. He currently holds an Institute Chair in the Department of Chemical Engineering. He served as the Head of the department from 2005-2008, and as the Dean of Faculty Affairs of IIT Bombay during 2009-2014. Apart from an abiding interest in liquid phase hydrocarbon oxidations, his work encompasses other themes in transport and reaction engineering. He is a Fellow of the Indian National Academy of Engineering.

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