

Industry lecture 2006

Tittelen på foredrag:

'Cat in a Hot Tin Tube'.

E. H. Stitt, Johnson Matthey Technical Centre, Billingham, UK.

Tid: 30. mai klokken 14.30.

Sted: Auditorium EL-5 (Elektro-bygget) ved NTNU -Gløshaugen i Trondheim.

Årets Industry lecture holdes i Trondheim 30.mai i forbindelse med 12th Nordic Symposium on Catalysis.

Hugh Stitt fra Johnson Matthey, UK, er årets inviterte foredragshodler, med tema katalyse.

Abstract

There has been much talk and emphasis in recent years on increased integration of catalysis development and reaction engineering. It is probably true to say that industry is better at this than academia. It is probably also true to say that such collaboration or integration of effort is essential to the development of commercially successful catalytic processes; hence why industry is the better practitioner. This presentation will address this issue from the viewing point of an industrial catalytic reaction engineer.

Too often we may compromise either the catalyst or the reactor because the development of the other is supposedly optimised. The optimisation in fact is an integrated process. Different catalysts for a given reaction can require significantly, even fundamentally different approaches to reactor design synthesis, and vice versa. Important factors here may be reaction thermochemistry as well as catalyst activity, selectivity and deactivation. There may indeed be multiple solutions that offer similar economic performance, but each of those optima will feature an integrated approach to the catalyst chemistry and reactor engineering.

Once a basis for catalyst and the reactor design concept are fixed, or even in operation, then improvements in one need to be sympathetic, or even empathetic to the needs and limitations of the other. Improvements in catalyst activity may exacerbate heat transfer issues, and equally changes in heat transfer performance may compromise the optimal catalyst temperature profile lead to increased deactivation or reduced selectivity. This leads, particularly but not exclusively in tubular reactors to a prima facie requirement for close integration of process, reactor and catalyst developments.

Well established examples of integrated development and operation of catalytic processes will be used to highlight the importance of a simultaneous and holistic optimization.

Increased integration of process operations, for example in multifunctional reactors, increases even further the need for an entwined approach to catalyst, reactor and process development, with the targets for each established on the basis of a holistic study.