Future Trends in Catalysis for Fine Chemicals

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Catalysis, especially heterogeneous catalysis, plays an important role in the fine chemical industry. During the last decades, several new approaches and concepts have been industrialized. In the field of catalysis, the industrially applied concepts of asymmetric oxidations/reductions, metathesis reactions and Pd-catalysed coupling reactions are well established and have been honoured with Nobel Prizes for their inventors. Also, the trend for the application of biotechnology in the field of pharmaceutical and fine chemical industry is on-going. Fine chemicals can be understood as functional molecules with moderate complexity, a production volume of at least 1 kt/a and a relatively low price (~15 USD/kg). Current trends in the fine chemical industry are establishment of selective and heterogeneous catalytical processes, such as multi-phase catalysis.

The question: “What is the future of fine chemical industry?” has to be answered. During the talk aspects of important future trends in catalysis for fine chemicals will be discussed. Here, aspects of starting materials, new and alternative feed-stock materials, new heterogeneous catalysis in combination with reaction and reactor design, less toxic catalysts, cheap and available catalysts, new aspects of bio-catalysis are in the focus. Furthermore, computer based understanding and development of new heterogeneous catalysts, especially solid based catalysts, and calculation of adsorption-desorption and substrate activation will support a deeper understanding of reaction mechanism and processes.