

Catalysis: An Enabling Technology for a Sustainable Development in the 21th Century

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Despite numerous important methodological advancements in all areas of chemistry, still most organic synthesis as well as the industrial production of chemicals can be improved. Currently, more than 80% of all products of the chemical industry are made via catalysis. In this regard, the development of new and more efficient catalysts constitutes a key factor for achieving a sustainable production of all kinds of chemicals today and in the future. Here, several major challenges will be presented in the talk; e.g. the use of mixtures for the synthesis of bulk chemicals. Furthermore, it will be shown that recently developed molecular-defined as well as nano-structured cobalt and iron catalysts enable us to perform catalytic hydrogenation processes with high yields and unprecedented selectivity. Specific examples which demonstrate the potential of catalytic processes with bio-relevant metal complexes compared to more traditional catalytic reactions will include hydrogenations and dehydrogenations as well as applications in the energy sector. In the future, also for industrial processes improved economics based on the presented novel catalysts might be expected.

Selected recent references

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