On the Verge of Stability – Intermetallic Compounds as Heterogeneous Catalysts

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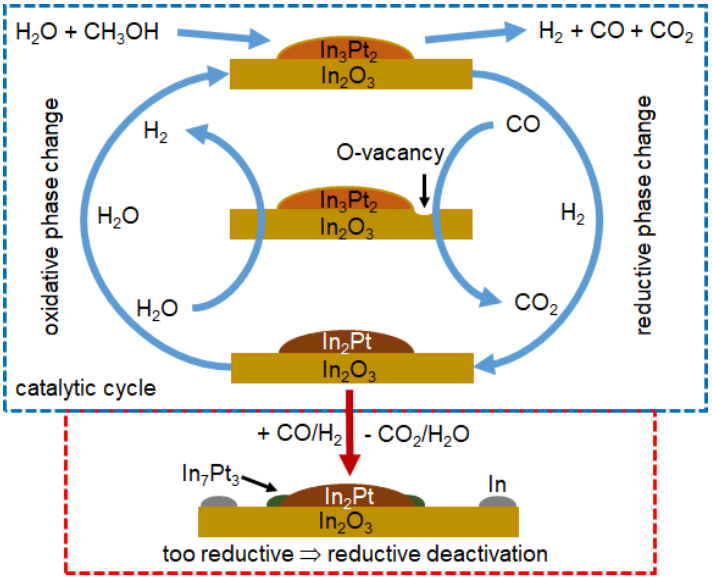
Intermetallic compounds have proven their potential in heterogenous catalysis impressively in the past years.[1-3] This is reflected in an ever-increasing publication rate in the past 15 years and becomes understandable by their unique combination of electronic and crystal structure. This enables new catalytic functionality not offered by any other class of compounds. Due to their electric conductivity the application of intermetallic compounds is comprising thermal catalysis and electro catalysis.

Starting with introducing this interesting class of materials, we will cover the peculiar possibilities that are offered by intermetallic compounds in heterogeneous catalysis. This comprises how to address fundamental questions in heterogeneous catalysis, including testing for geometric and electronic factors,[4] and how decisive the stability under reaction conditions is. Starting with the semi-hydrogenation of acetylene and strongly reducing conditions, we then explore the verge of stability and how the limited resistance against oxidation can be beneficial in methanol steam reforming.[5,6]



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