Mechanistische Studien an katalytischen Reaktionen in der Elektrosynthese


In this work, combinations of electrochemical and catalytic reactions were investigated from a mechanistic point of view on four examples. The insights into these details expand the general understanding of the reactions and open up the possibility of their direct improvement. The first two examples deal with the electrocatalytic reduction of carbon dioxide. The investigated catalysts are manganese- and ironbased complexes that generate carbon monoxide with very good faradaic yields. A reaction mechanism could be proposed, which allows comparisons to related photocatalytic and established electrocatalytic systems. The third example examines the electrochemical variant of the Newman-Kwart rearrangement and shows how induced electron holes can serve as catalysts. Here a reaction mechanism and a model for the predictability of the reaction regarding unknown substrates was established. In the fourth example, the required key steps to transfer an aryl iodide as a mediator from an ex-cell-process to a catalytic in-cell-process are highlighted.