Universität Basel

Research Project

Mechanistic investigations of organocatalytic and metal based reactions / React-IR

Third-party funded project

Project title Mechanistic investigations of organocatalytic and metal based reactions / React-IR
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ReactIR spectroscopy allows for on-line monitoring of reactions under the actual reaction conditions. In comparison to other analysis methods it does not require to disturb the reaction by e.g. sample removal. In situ IR reaction monitoring is therefore a particularly valuable tool for mechanistic studies and optimization of reaction conditions. We will use the instrument to gain insight into the mechanism of reactions that are catalyzed by metal-based catalysts or organocatalysts and to optimize the reaction conditions.

With respect to metal-based catalysts, asymmetric hydrogenations, Cu-catalyzed asymmetric acylation of alcohols, Cu- and Ag-catalyzed cycloadditions as well as Heck reactions will be examined (research of Prof. A. Pfaltz, supported by SNF grant 200020-107587). In the area of organocatalysts, we will study the mechanism of aldol and conjugate addition reactions that are catalyzed by peptidic catalysts (research of Prof. H. Wennemers, supported by SNF grant 200020-109511). Furthermore, the self-assembly of functional solid state materials based upon one-, two and three-dimensional coordination structures will be elucidated (research of Prof. E. Constable, supported by SNF grant 200020-113305/1).

Keywords peptides, asymmetric catalysis, material science, chiral induction, Pfeiffer effect, organocatalysis, hydrogenations, chiral coordination compounds, dendrimers
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