



VABILO NA INŠTITUTSKO PREDAVANJE / INVITATION TO THE INSTITUTE LECTURE

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Velika predavalnica Kemijskega inštituta / Lecture Hall at the
National Institute of Chemistry; Hajdrihova 19, Ljubljana

Rhodium-complex catalyzed enantioselective hydrogenation - new results

Povzetek / Abstract

Rh-catalyzed enantioselective hydrogenation of olefins is a powerful tool for the synthesis of biologically active compounds. For the homogeneously catalyzed asymmetric hydrogenation of prochiral olefins, ketones or imines, complexes of rhodium have particularly been used besides complexes of ruthenium, iridium and recently also iron. The use of these complexes is in no way limited to academia, as is powerfully demonstrated by the large scale preparation of the grass herbicide Metolachlor.

Besides high selectivities also high catalytic activities are of interest. Using cationic rhodium complexes a row of deactivation phenomena can occur. The talk will present I) induction periods, which result from the transformation of different catalyst precursors into the catalytically active species, II) stable arene complexes, which can be formed from aromatic solvents, phenyl rings of ligands' backbones and even substrates containing aromatic moieties, and III) multinuclear complexes.

The homogeneously catalyzed asymmetric hydrogenation of prochiral olefins with cationic rhodium complexes is one of the best understood selection processes. Mechanistic investigations revealed for some catalyst/substrate complexes the validation of the major/minor principle: the concentration-wise deficient minor substrate complex, possessing a very high reactivity, yields the excess enantiomer. Exemplified for the reaction system $[\text{Rh}(\text{DIPAMP})(\text{MeOH})_2]^+$ /methyl-(Z)- α -acetamidocinnamate Halpern et al. have been able to identify all relevant rate constants.

Hitherto, these mechanistic investigations have been limited to α -dehydroamino acid derivatives. The second part of the talk will thus present own contributions with respect to the mechanism of the asymmetric hydrogenation of β -dehydroamino acid derivatives, enamides and itaconic acid derivatives.

Vljudno vabljeni! / Kindly invited!