

Assignment for Master's thesis
by cand. M. Sc. xxx

Immobilizations of enzyme models on particles for use in aziridination reactions

Background

Enzyme models are chemical compounds that can catalyse a large number of reactions by replicating the active site of an enzyme. Compared to enzymes, however, they have the advantage that they are easier to produce and therefore cheaper, as well as less sensitive to organic solvents. So far, the focus of research in the field of enzyme models has been in the area of basic research and mechanism elucidation. The next step is to immobilise the enzyme models in order to improve the technical applicability of the systems and enable the catalyst to be reused. For this purpose, different particles are to be used and different immobilisation strategies pursued.

Tasks

Within the scope of this work, the catalyst used is to be covalently immobilised on particles in order to enable reusability of the catalyst. For this purpose, the corresponding parameters have to be established. Subsequently, the catalytic performance in the aziridination of styrene is to be tested with the immobilisates in batch and subsequently also in first flow-through experiments. At the same time, an attempt will be made to transfer the aziridination reaction to the environmentally friendly medium of water by using suitable substrates and oxidants. The yields will be investigated by means of HPLC. A suitable methodology for the analysis must be established for the substrates used.

Practical aspects of the work are:

- Development of a method for the covalent immobilisation of the enzyme model on particles.
- Testing the activity in batch experiments with the aziridination of styrene
- First attempts at continuous flow experiments
- Attempt to transfer the reaction into aqueous medium
- Clear documentation of the results in written form and presentation in a seminar lecture

Start of work xxx
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