Prof. Dr. Frank Holmann
TU Delft

Catalysis Connected

Title
Biocatalysis for organic synthesis: Why and how?

Abstract
Enzymes are Nature's catalysts without which life as we know it would not be possible. Enzymes, however, are also very useful catalysts for organic synthesis as they enable highly selective transformations under mild reaction conditions. Especially selectivity is a feature, which on the one hand can significantly simplify synthetic routes e.g. by avoiding tedious protection group chemistry. On the other hand, a narrow substrate scope can also severely limit the preparative value of a too selective enzyme. Enzymes generally operate in aqueous media, which is often considered as an environmental advantage. Transformations of hydrophobic reagents in aqueous reaction media are, however, notoriously inefficient due to high dilution.
Overall, biocatalysis offers a lot of exciting opportunities but also faces some significant challenges en route to becoming a standard tool for organic synthesis. This presentation will give a critical overview over the possibilities and limitations of preparative biocatalysis.