Abstract

Chiral sulfoxides are not only effective pharmaceuticals but also widely used ligands and catalysts in asymmetric synthesis. The first aim of this work was to synthesize a series of chiral sulfoxides to investigate the substrate scope of the enzyme methionine sulfoxide reductase A (MsrA). A range of chiral sulfoxides was prepared, and the limitations in the reactivity of various MsrA variants were identified. The second objective of this thesis was the asymmetric synthesis of benzoxazole chloromethyl sulfoxide, which can serve as a versatile chiral synthon for the preparation of chiral sulfur compounds. A chiral ligand for Mn(II)-catalyzed oxidation was successfully synthesized and tested in a reaction with a prochiral sulfide.

Key words: *Methionine sulfoxide reductase (MsrA), kinetic resolution, racemic sulfoxides, asymmetric oxidation*