

Immobilization of a chiral salen catalyst, a grafting versus an encapsulation approach

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In the last decades chiral salen complexes have proven their value as enantioselective epoxidation catalysts.^[1] The original manganese-salen complex allows the enantioselective epoxidation of unfunctionalized olefins with an enantiomeric excess of over 90%.^[2] The applicability of these complexes is limited by their recoverability from the homogeneous mixture and the occurrence of an irreversible stacking, deactivating the complex. In order to circumvent these problems the complex can be immobilized on a solid material. As a carrier metal organic frameworks (MOFs) will be used. These hybrid materials consist of metal(oxide) nodes connected by organic linkers. We propose two immobilization methods, the first one uses the inherent advantage of MOFs that the organic linkers can easily be modified. In this approach the Jacobsen salen type complex is covalently grafted to the carrier (MIL101(Cr)). Previous research has shown that this approach often leads to a decrease in activity and selectivity. Therefore another procedure is proposed where the complex is encapsulated via a „bottle around a ship“ approach where the cages of NH₂-MIL101(Al) serve as a microreactor containing a single active site.^[3]

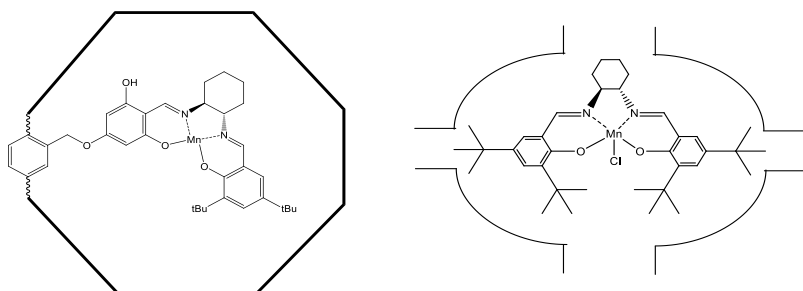


Figure 1. Two approaches for the immobilization of the salen complex; grafting (left) and the bottle around a ship approach (right)

[1] Katsuki, T., *J. Synth. Org. Chem. Jpn.*, (1995) **53**, 940.

[2] Jacobsen, E. N.; Zhang, W.; Muci, A. R.; Ecker, J. R.; Deng, L., *J. Am. Chem. Soc.*, (1991) **113**, 7063.

[3] Bogaerts, T.; Van Yperen-De Deyne, A.; Liu, Y.-Y.; Lynen, F.; Van Speybroeck, V.; Van Der Voort, P., *Chem. Commun.*, (2013) **49**, 8021.

Met opmerkingen [m1]: Ik heb de auteurs beperkt gehouden want met dit template neemt een auteur veel plaats in