

Enantioselective Epoxidation With Hybrid Organic/Inorganic Materials

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The asymmetric epoxidation of unfunctionalized prochiral olefins catalyzed by chiral (salen)Mn(III) complexes is an important viable route to obtain chiral epoxides. In this context, many efforts have been devoted to reduce the amount of the Manganese metal ion into the catalytic systems. One of the most used strategy is to heterogenize the Jacobsen catalyst onto a solid surface [1]. Another strategy is to obtain nanocatalysts [2], in which the amount of metal atoms is significantly reduced respect to the standard catalysts. Recently we developed hybrid organic/inorganic catalysts, able to catalyze the enantioselective epoxidation of prochiral alkenes, with high efficiency, enantioselective, TON and TOF values. In particular, we designed and synthesized new chiral (salen)Mn(III) complexes, able to be covalently anchored onto silica surface, thus obtaining heterogeneous catalysts. In addition, a new protocol to obtain Carbon Nanoparticles (CNPs) covalently functionalized with a chiral Mn-salen catalyst was developed. The new nanocatalyst shows better enantiomeric excess values respect to the catalyst single molecule, highlighting the role of the nanostructure in the enantioselectivity.

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