Conferences attended

- National Symposium on *'Frontiers in Chemistry - NSFC 2022'*
- National Symposium on *'Frontiers in Chemistry and Medicinal Chemistry- FICM 2021'*
- Virtual international conference *'Molecules to Materials MTM 2020'* – Oral presentation on catalytic materials
- National Symposium on *'Advances in Chemical Research- ACR 2019'* – Poster presentation
- Heterogeneous catalysts conference *'HETCAT 2018'* – Poster presentation
- National Conference on Chirality- '*NCC 2017'*

Publication

WILEY-VCH

ChemPubSoc Europe

DOI: 10.1002/slct.201903032

Chemistry SELECT Full Papers

Catalysis

Asymmetric Direct Aldol Reaction in Confined Space: Molecular Conformations of Organocatalyst Affect Chiral Induction

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We have demonstrated that chiral induction in the aldol product is possible by generating an enzyme-like cavity in molecular framework of the amphiphlic catalyst. The esters of *trans*-4-hydroxy-L-proline and long chain fatty acids have been synthesized by *O*-acylation. Synthesized molecules were used as organocatalysts for asymmetric direct aldol reaction between 4-nitrobenzaldehyde and cyclohexanone. The molecular framework of the catalyst not only induces the amphiphilicity but also acquires specific conformation leads to formation of catalytic cavity facilitating stereo-induction in the aldol product. Systematic addition of olefinic bonds in the long hydrocarbon chain makes this cavity more robust stabilizing transition state of the aldol product. By proper tuning of the water content and % loading of the catalyst in aldol reaction, o/w or w/o type emulsion is formed due to aggregation of catalyst molecules. Performance based evaluation of catalytic activity suggests that aldol reaction proceeds with ~ 99% yield, 84% dr and 97.94% ee in presence of 10% catalyst (having three π bonds), in an o/w emulsion (85 equiv. of water) within 12 h. The stereoselectivity of the catalyst is almost maintained up to 2.5% loading. The high stereoselectivity of the aldol reaction is maintained even on increasing the amount of water to 300 equiv. A plausible reason has been proposed for retaining the high stereoselectivity and corroborated by computational analysis.

ChemistrySelect 2019, 4, 13210-13218

- Patel H. A.; Katariya S. S.; Barot J. M.; Sahoo S. K.; Soni H. P. One-pot Direct Asymmetric Mannich Reaction in Emulsion Media: Stereochemistry of the Two Chiral Centers Affected by Unsaturated C18-Fatty Acid Cavity of the Organocatalyst. (*Manuscript submitted for publication*)