

Cooperative Asymmetric Catalysis Under Confinement

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Our research group has developed numerous homogenous polyfunctional catalysts. The design was inspired by enzymes with various functional groups of a catalyst system work in concert to accelerate and control a chemical reaction. This enables the simultaneous activation of the substrates and high catalytic activity and stereo control to be achieved. Based on this performance cooperative Catalyst should be investigated in heterogeneous catalysis to analyse its behaviour under confinement in mesoporous materials. In order to respond to the primary question, whether the entropic advantage of enzymes can be transferred to artificial immobilized bifunctional catalysts through confinement effects? In pursuit of this objective, a number of approaches were employed to generate a heterogeneous catalyst, including covalent immobilization using a trialkoxysilyl linker and the development of a supported ionic liquid phase (SILP) catalysis system. This work presents the successful synthesis of a triethoxysilyl linker-modified cooperative catalyst and the results of the heterogeneous studies.

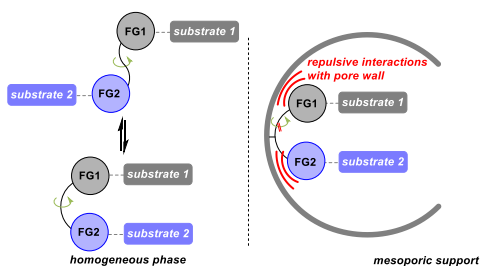


Figure 1: Rigidified catalyst under confinement

[1] M. Titze, J. Heitkämper, T. Junge, J. Kästner, R. Peters, *Angew. Chem. Int. Ed.* 2021, *60*, 5544-5553.

[2] J. Heitkämper, J. Herrmann, M. Titze, S. M. Bauch, R. Peters, J. Kästner, *ACS Catal.* 2022, *12*, 1497.