ASYMMETRIC CATALYSIS IN THE CONFINED SPACE PROVIDED BY L-PROLINE FUNCTIONALIZED MESOPOROUS SILICA HAVING PLUGS IN THE PORE

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The existence of mesoporous silica shows very rapid progress since the discovery of M41S family in 1992.[1, 2] In other discipline, asymmetric catalytic reaction catalyzed by simple metal-free organic functional group currently is attracted great interest for their excellence in activity.[3, 4] Among such catalysts, amino acid based organocatalysts are vastly applied in asymmetric catalysis complementing enzymes and metal complexes.[5-8] Combination of metal-free organic functional group and mesoporous silica support will be a great strategy for achieving ideal green catalysis.

Here, we report direct synthesis of l-proline functionalized mesoporous silica by using microwave. The direct synthesis gave morphosynthesis of prism or disk type with short channels and plugs in the pore structure.[9] The unique characteristic of the pore provided chiral enhancement in the diethyl malonate addition and Aldol condensation reaction. Moreover, the properties of plugged proline mesoporous silica has been studied for chiral adsorbtion of D/L alanine and observed by cyclo dichroism (CD) technique. This finding may be important from the point of view of real application of amino acid based organo functionalized mesoporous silica.

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