

Lego chemical factory using 3D Micro Catalyst Structure

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Since organic synthesis could affect the materials making up the microfluidic devices, selection of the materials is extremely important. Among the materials for microfluidic devices, especially fluoropolymer is well known for its low surface energy, modulus, toxicity and high solvent resistance. Therefore, for materials in microfluidic devices, perfluoroalkoxy capillary tube is widely used in organic synthesis. However, there are serious limitations regarding integration and miniaturization. Moreover, it needs large cost and complex process to integrate micromixer and functionalized catalyst. In this work, we developed capillary-based microfluidic systems combining various catalyst containers and micromixer for organic synthesis using 3D printer. The scaffold microstructure was made by 3D printer, which can be effective with low manufacturing cost, easy bonding and removing of the catalyst like 'Lego', and moreover high catalytic performance.