

Non-lithographic fabrication of microfluidic devices by Sacrificial Mold Printing process for organic synthesis

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Microfluidics is becoming a central technology of miniaturized systems. In synthetic chemistry, they need so many trials and errors to find ideal reactions which synthesize expensive products from inexpensive reactants. To apply microfluidic devices as chemistry finder, they should have fast response to feedbacks from chemist such as changes in shape or width of microchannels. Conventional fabrication methods, such as photo-lithography and soft lithography, however, involve expensive and time-consuming steps. Also there are limitations for fabrication of 3D microfluidic systems. Recently, there are also attempts to apply 3D printing to microfluidic fabrication. However, those studies couldn't overcome them, since they directly printed the entire body part of the device. Herein, we introduce new fabrication methods using a 3D printer and sacrificial molding process, which is named 'Sacrificial Mold Printing' process. The feasibility for organic synthesis was proved by tests confirming solvent resistance, pressure resistance, and catalytic reactions.