Stop flow lithography synthesis of organic solvent-based particles using NOA channel

김동욱, 엄지연, 봉기완†
고려대학교
(bong98@korea.ac.kr†)

Polydimethylsiloxane (PDMS) has been used as a typical material for fabricating microfluidic device due to some advantages, including optical clarity, and gas permeability. However, PDMS has restrictions such as short-term modified surface condition and deformation under high pressure. Crucially, PDMS devices have a critical restriction known as swelling in organic solvents. To overcome the limitation, Norland Optical Adhesive (NOA) has been introduced as an alternative for fabricating microfluidic devices, especially for organic solvent-based operation. However, due to low oxygen permeability, NOA devices are not applicable to a microfluidic technique called as stop flow lithography (SFL). In the SFL process, the low permeability to oxygen leads to an absence of oxygen lubrication layers that are required to prevent particle sticking to NOA devices. We present a method for fabricating NOA devices with oxygen-permeable PDMS coating. The devices can exhibit oxygen lubrication layers that can be used for organic solvent-based SFL process. The use of organic solvent may expand the material selection of the SFL process and consequentially increases the chemical diversity of particles.