

## Three-Dimensional Nanofabrication with Nanotransfer Printing and Atomic Layer Deposition

김수환, 한규석, 한기복, 성명모

한양대학교 화학과

We report a new patterning technique of inorganic materials by using thin-film transfer printing (TFTP) with atomic layer deposition. This method consists of the atomic layer deposition (ALD) of inorganic thin film and a nanotransfer printing (nTP) that is based on a water-mediated transfer process. In the TFTP method, the Al<sub>2</sub>O<sub>3</sub> ALD growth occurs on FTS-coated PDMS stamp without specific chemical species, such as hydroxyl group. The CF<sub>3</sub>-terminated alkylsiloxane monolayer, which is coated on PDMS stamp, provides a weak adhesion between the deposited Al<sub>2</sub>O<sub>3</sub> and stamp, and promotes the easy and complete release of Al<sub>2</sub>O<sub>3</sub> film from the stamp. And also, the water layer serves as an adhesion layer to provide good conformal contact and form strong covalent bonding between the Al<sub>2</sub>O<sub>3</sub> layer and Si substrate. Thus, the TFTP technique is potentially useful for making nanochannels of various inorganic materials.