Fabrication of Multi-Shape PEG Hydrogel Microstructures to Detect Various Types of Analytes

의우진, 최동길, 이 열, 김대년, 고원건*
연세대학교 화학공학과
(wongun@yonsei.ac.kr*)

Different shapes of hydrogel microstructures were fabricated using photolithography, which was used for shape-encoded biosensor. PDMS channel was fabricated on photoresist master, glass substrate was spin-coated by PDMS polymer, and then these were bond together to form the channel. PEG pre-polymer mixed with probe biomolecules which was labeled by individually different color was inserted by capillary force. The pre-polymer filled channel was placed on the photomask and exposed to UV light. After UV exposure, only exposed region was crossliked and hydrogel columns were formed. PEG microstructures such as circular, triangular, square shapes were fabricated in PDMS channel by each photomask.
Each shape-encoded sensor type can be individually mass produced, and multi-analyte microstructures can be prepared by randomly assembling a mixture of the desired sensor types. Multi-color optical assay for targeting biomolecules has been achieved by embedding different-color tagged proteins into hydrogel microstructures.