

Fabrication of Hybrid PDMS Nanochannel for Improving of Nanoflow using Hydrophilic Materials

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Microchannel or nanochannel have become an important design aspect in the creation of many of today's microdevices. The conventional substrates of making microdevices are silicon and glass or quartz, metals and organic polymer. Among the polymers, polydimethylsiloxane(PDMS) is one of the most promising materials for the microscale molding. The advantages of using PDMS to fabricate microchannels are low cost, submicrometers replica fidelity, easy fabrication and bonding, massreplication and better optical properties. But, PDMS is a highly hydrophobic material, which makes difficult transferring aqueous solutions within microfluidic channels or networks. Therefore, we adopt new hydrophilic material(HPIM) which can be cured by crosslinking initiator with UV and heat, and has lower contact angle than that of PDMS with water below 30°. In addition, This HPIM has resistance for several solvents(e.g. alcohols) after corsslinking, and UV transparency. In conclusion, hybrid HPIM-PDMS microdevice will provide good solutions for flow of aqueous system to replace hydrophobic PDMS microdevice in nanoflow channels.