

Solvent Resistance of various Inorganic polymer for Microfluidic devices applications

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In recent times, fabrication of MEMS or micro devices by using diverse polymeric materials, especially preceramic polymers has received much attention due to their chemical inertness and high thermal and mechanical stability[1-3]. Therefore, microfluidic devices fabricated from preceramic polymer such as SiCN-based inorganic polymer will be a suitable choice for high temperature applications, such as in catalytic chemical reactions, electronic devices, and structural composites. Moreover high optical transparency is allowed to a wide range of application like glass microreactors. This paper describes the durability of inorganic polymer against organic solvents; that is important in considering the potential of inorganic polymer microfluidic devices in a number of application, especially including that of microreactors for organic solvent circumstance. To evaluate the performance of cured inorganic polymer, it was soaked in each solvent for 24 hours. Swelling ratio(S), which were measured experimentally; $S = D1 / D0$, where D1 is immediately measured length of cured polymer after soaking in the solvent (30m, 90m, 150m, 24h) and D0 indicates initial length of cured polymer before soaking in solvent respectively.