

Solvent compatibility of cured poly(vinyl silazane) for microfluidic devices

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In recent times, fabrication of MEMS by using ceramic materials, especially preceramic polymers has received much attention due to their chemical inertness and high thermal stability. Therefore, microfluidic devices fabricated from preceramic polymer such as SiCN-based poly(vinyl silazane)(PVS, KiON-Ceraset VL-20, KiON Corp. USA) will be a suitable choice for high temperature applications, such as in catalytic chemical reactions, electronic devices, and structural composites. Moreover high UV transparency is allowed to a wide range of application like glass microreactors.

This paper describes the compatibility of PVS with organic solvents; this compatibility is important in considering the potential of PVS-based microfluidic devices in a number of application, especially including that of microreactors for organic solvent. Cured PVS was soaked in each solvent for 100 hours. Swelling ratio, which were measured experimentally; $S = D1 / D0$, where D1 and D0 are immediately measured length of cured polymer after soaking in the solvent and length before soaking in solvent respectively.