

## Fabrication and characterization of non-oxide ceramic pattern by using the UV-NIL

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Microelectromechanical systems (MEMS) is a rapidly growing technology with a broad range of commercial applications and a diverse collection of evolving MEMS sensors and actuators. However, silicon and organic polymers, the most commonly used materials for MEMS today, can not be utilized as the structural materials in harsh conditions. Therefore, it has been concerned to develop new fabrication techniques for tribological non-oxide ceramic MEMS which is able to use at high temperatures and corrosive circumstances. In this study, nano-scale siliconcarbide-based ceramic patterns on Si substrates were fabricated by UV-NIL technique for the first time using a liquid ceramic precursor (KiON VL20, www.kioncorp.com) and DVD as economic nano-scale masters. The ceramic patterns were prepared by UV (300nm wavelength) curing with photo initiators, such as Irgacure 500, followed by high pyrolytic temperature (800oC) in a nitrogen gas atmosphere. The important consideration in the design and fabrication of SiCN MEMS using photopolymerization is the shrinkage of the pre-ceramic polymer as it is pyrolyzed. The patterns for shrinkage measurement were analyzed by FE-SEM and AFM.