

Abstract Submitted  
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**Oriented Mesoporous Inorganic Thin Films Using Laterally Confined Swellable Block Copolymer Templates.** SE GYU JANG, UCSB, EDWARD J. KRAMER, UCSB, SEUNG-MAN YANG, KAIST, KAIST (SNL) COLLABORATION, UCSB (KRAMER) COLLABORATION — The control of grain orientation and long-range ordering of mesoporous inorganic materials produced by a sol-gel reaction of an inorganic precursor in self-assembling amphiphilic template systems have been limited due to the restrictions both on the time-scale and conditions for processing imposed by network formation of the inorganic component. Our goal is to form ordered mesoporous inorganic thin films by starting with a crosslinkable block copolymer template with long range order. A cylindrical poly(styrene-2-vinylpyridine) (PS-P2VP) diblock copolymer with  $M_n = 32.7$  kg/mol and  $f_{PS} = 0.21$  was spin-cast onto a set of 30 nm high and 2000 nm wide SiO<sub>x</sub> channels on Si substrates produced by optical lithography. An ordered PS-P2VP monolayer<sup>1</sup> is achieved via slow cooling after heating above its bulk order-disorder transition temperature (212 C), measured by small angle X-ray scattering. Hybrid inorganic/organic structures are fabricated by incorporation of inorganic precursor into the chemical cross-linked P2VP matrix.<sup>2</sup> Cylindrical pores within the inorganic matrix are then obtained by removal of the organic component using UV-ozone treatment. <sup>1</sup>M.R.Hammond, E. Cochran, G.H. Fredrickson, E.J. Kramer *Macromolecules* **38** 6575 (2005). <sup>2</sup>R.C. Hayward, B.F. Chmelka, E.J. Kramer *Macromolecules* **38** 7768 (2005).

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