

Flexible Microfluidic Devices with Three-Dimensional Interconnected Microporous Walls for Gas and Liquid Applications

Po Ki Yuen* and Michael E. DeRosa

Science and Technology, Corning Incorporated, Corning, New York, 14831-0001, USA

Email: yuenp@corning.com

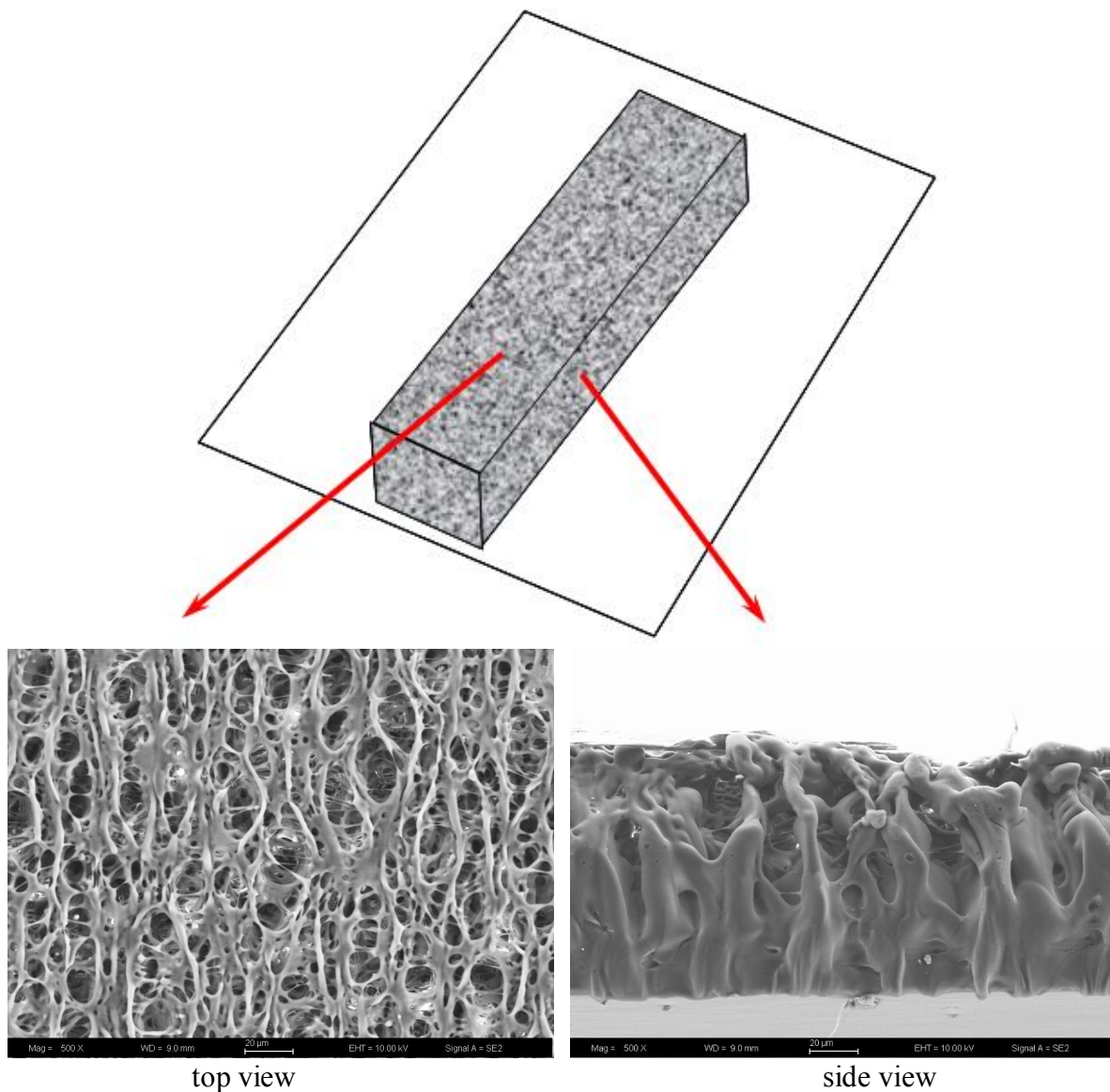


Fig. S1 Scanning electron microscopy (SEM) images of microporous structures. Microporous structures were patterned on polystyrene film using tetrahydrofuran (THF)/isopropanol (IPA) solvent mixture (40/60 v/v %) for 15 s at room temperature and blown dry with nitrogen.

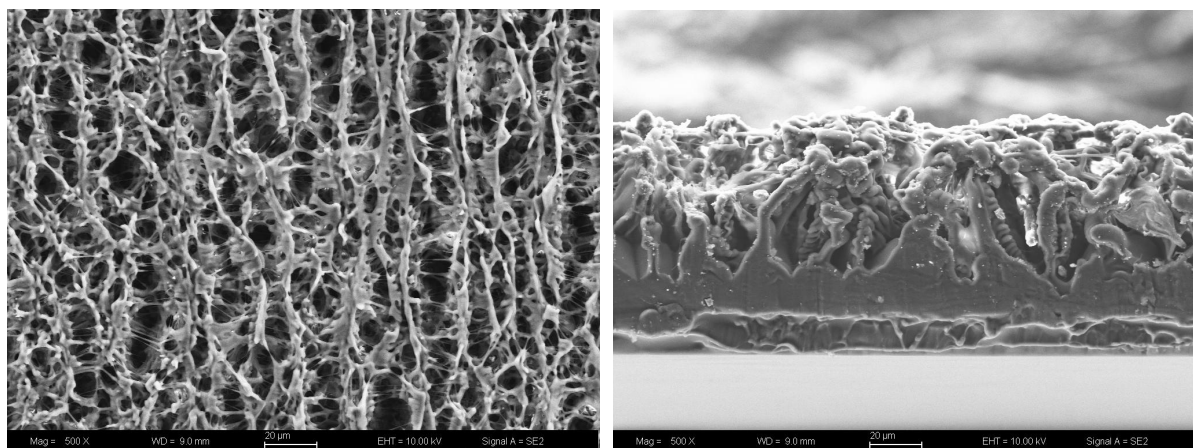


Fig. S2 SEM images of microporous structures. Microporous structures were patterned on polystyrene film using (THF)/IPA solvent mixture (40/60 v/v %) for 5 s at room temperature and blown dry with nitrogen. Left: top view. Right: side view.

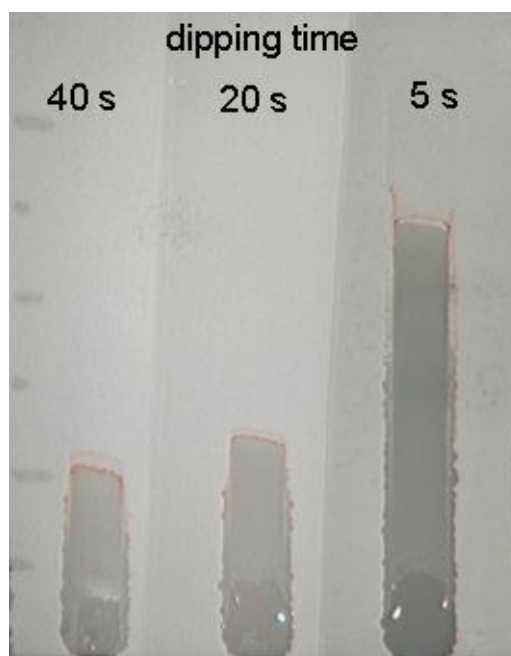


Fig. S3 Water wicking test on oxygen plasma treated microporous polystyrene film. Microporous structures were first patterned using THF/IPA solvent mixture (40/60 v/v %) for 40 s, 20 s and 5 s at room temperature and blown dry with nitrogen. Then, the microporous polystyrene film was exposed to oxygen plasma at 30 W for 60 s. Next, water droplets were pipetted at the same time onto the bottom of the microporous film and allowed to wick up the film until it came to a stop. The height of the wetted region was proportional to the wicking speed. The marks on the left are 1 cm each in height.

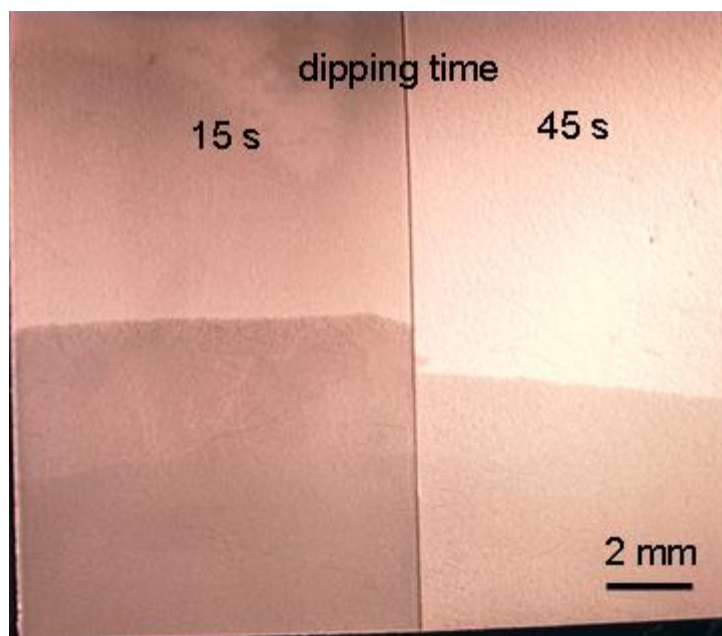


Fig. S4 Isopropanol (IPA) wicking test with non-oxygen plasma treated microporous polystyrene film. Microporous structures were patterned using THF/IPA solvent mixture (40/60 v/v %) for 15 s and 45 s at room temperature and blown dry with nitrogen. The microporous films were dipped simultaneously into IPA for 10 s allowing IPA to wick up the films.