Electronic Supplementary Information

Anisotropic Janus Si Nanopillar Arrays as a Microfluidic One-Way Valve for Gas-Liquid Separation

Tieqiang Wang,[a c] Hongxu Chen,[a] Kun Liu,[a] Yang Li,[b] PeihongXue,[a] Ye Yu,[a] Shuli Wang,[a] Junhu Zhang,*[a] Eugenia Kumacheva*[b] and Bai Yang[a]

a State Key Laboratory of Supramolecular Structure and Materials, College of Chemistry, Jilin University, Changchun 130012, P. R. China. E-mail: zjh@jlu.edu.cn; Fax: +86-0431-85193423; Tel: +86-0431-85168283.
b Department of Chemistry, University of Toronto, Toronto, Ontario M5S 3H6, Canada. E-mail: ekumache@chem.utoronto.ca.
c Research Center for Molecular Science and Engineering, Northeastern University, Shenyang 110004 (P. R. China).

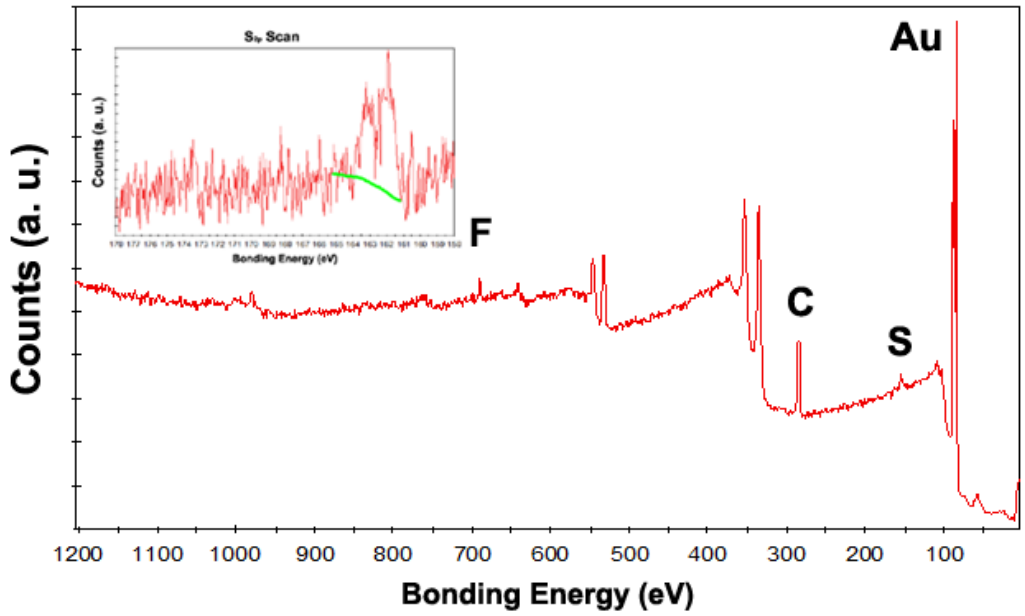

Figure S1. The XPS spectrum of the as-prepared Janus arrays after the MHA modification. The inset shows the S_{2p} peak.

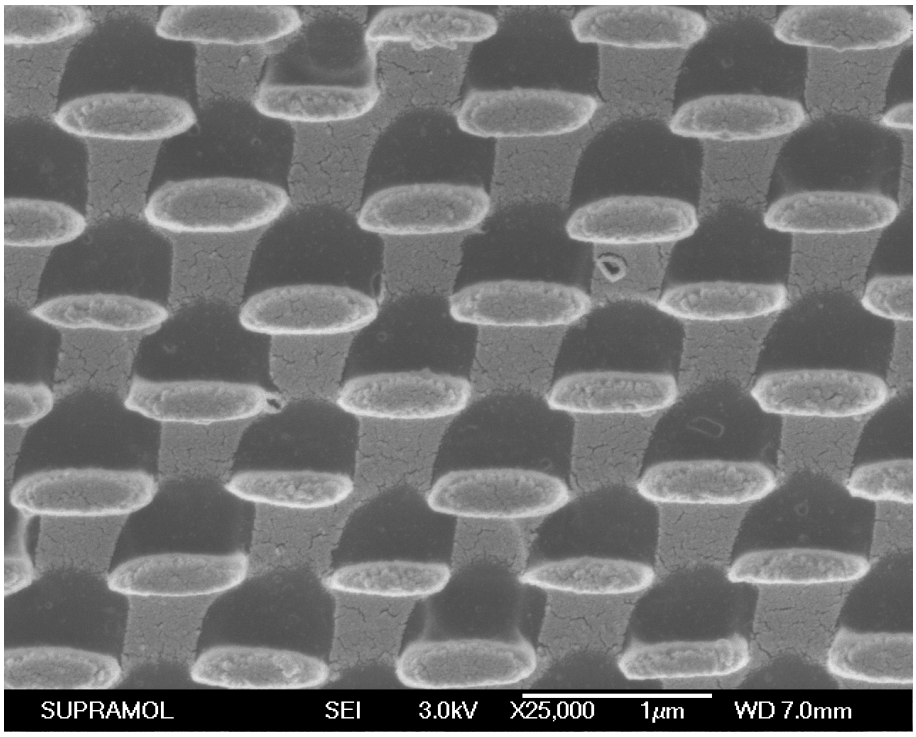

Figure S2. The SEM images of the PFS-MHA Janus Si pillar arrays fabricated through oblique evaporating gold along the short axis of the elliptical pillars.

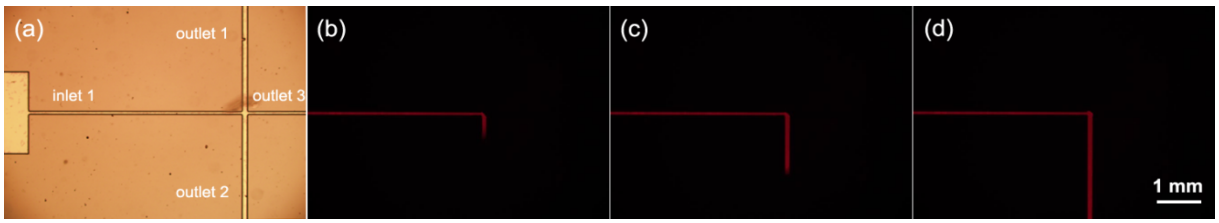

Figure S3. (a) Images of the cross-shaped MF channel and (b)-(d) Rhodamine aqueous solution injecting in a cross-shaped MF channel taken at different time. The scale bar is 1 mm and the downward direction is the MHA-modified direction.

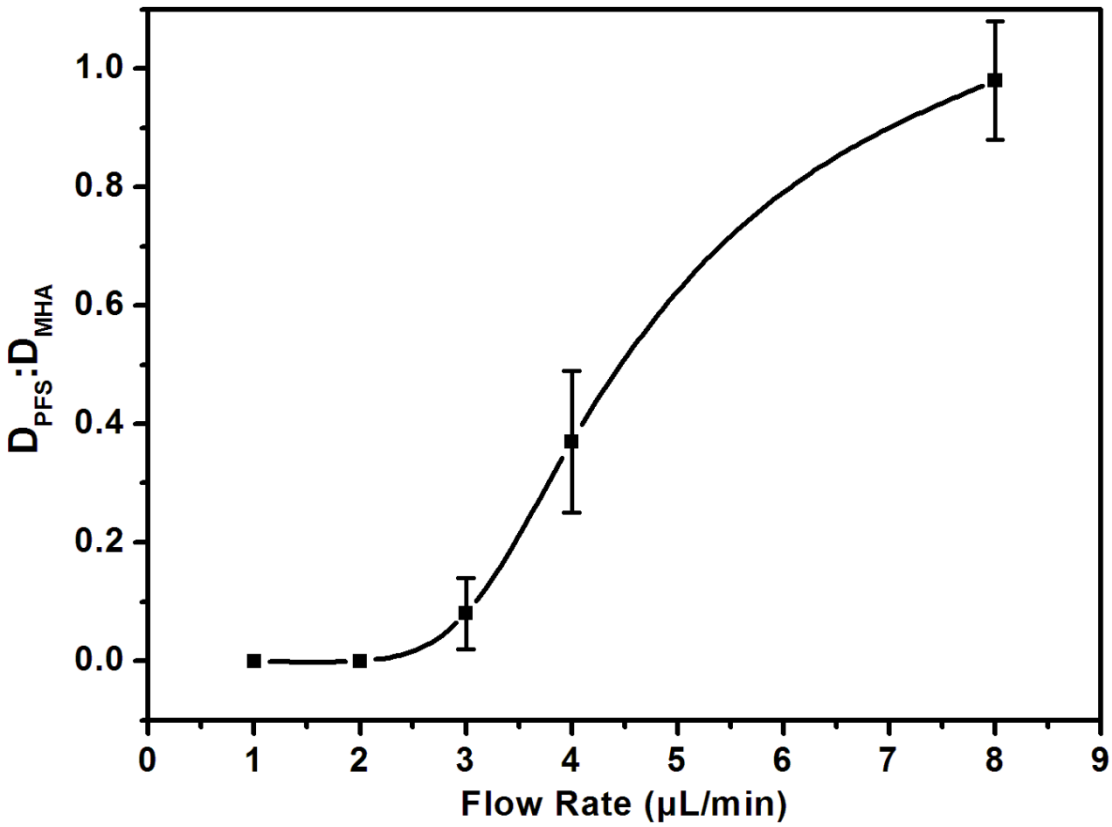

Figure S4. The plot data of D_{PFS}: D_{MHA} against the flow rate of the aqueous solution.

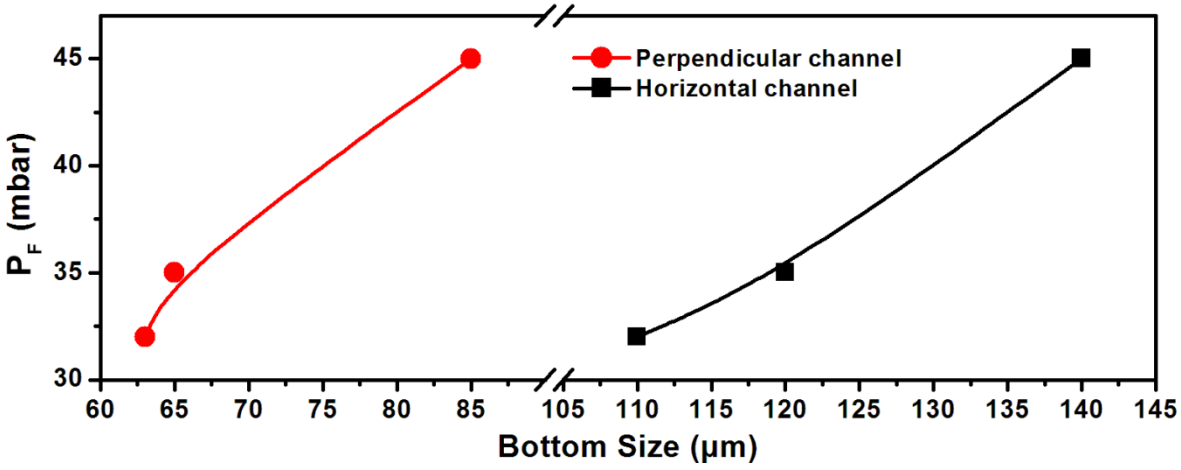

Figure S5. The plot data of failure pressure against the bottom size of the channel.

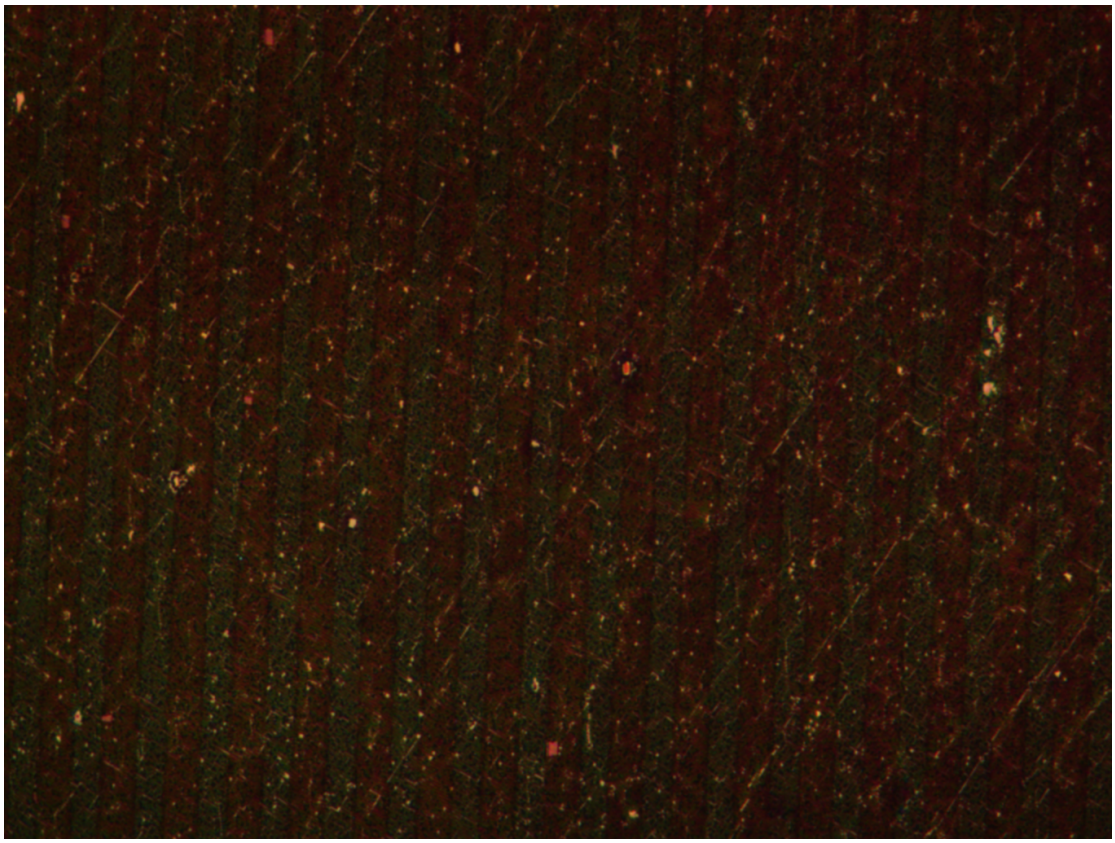

Figure S6. Optical microscopy images of the Janus pillar array with less density of pillars. The density is about half of the original sample. The dark green area is the Janus pillar array, while the red area is the pillar arrays without Janus modification.

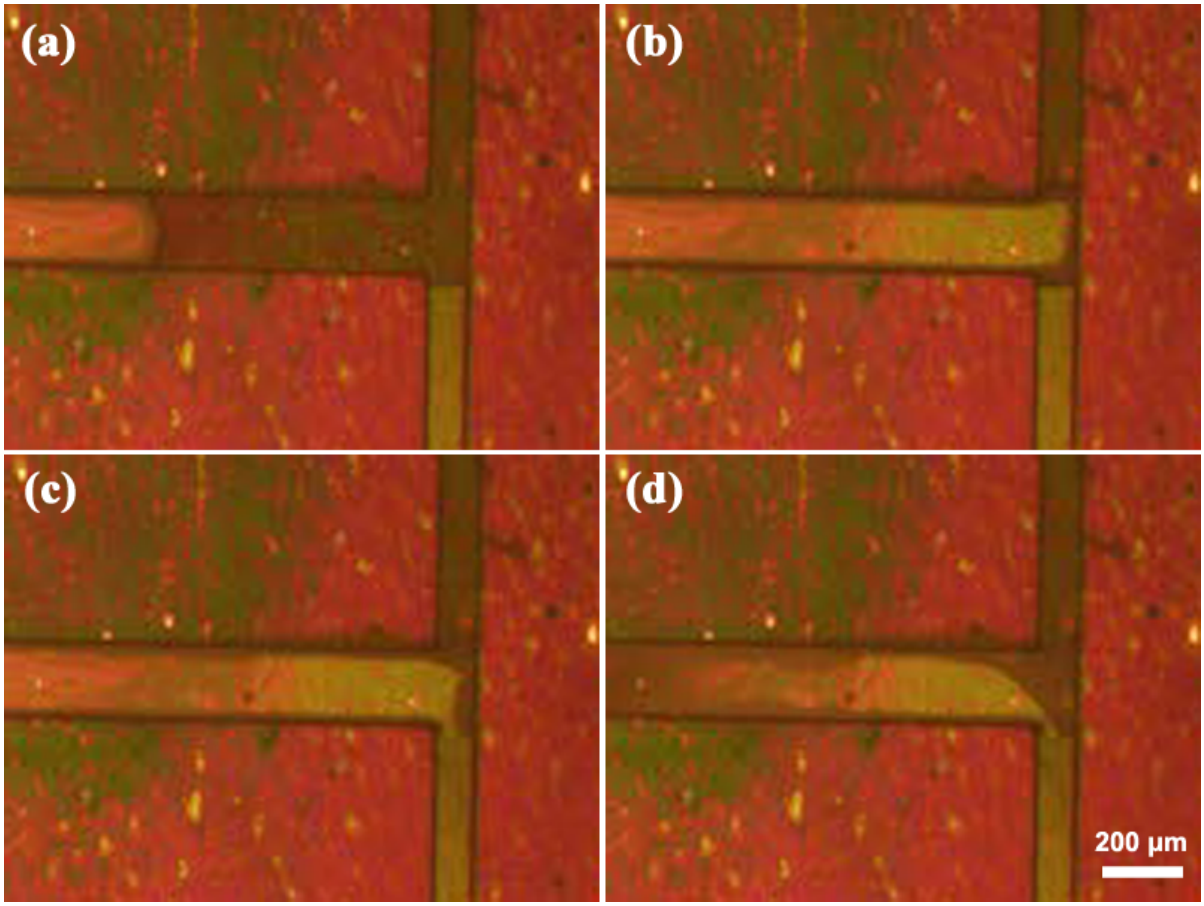

Figure S7. Optical microscopy images of the T junction with higher magnification. (a) The air bubble flowed towards the T junction; (b) the air bubble arrived at the T junction: (c) the air bubble broke and flowed out; (d) the following water filled the place of the air bubble after the flowing out of the air.