Electronic Supplementary Material (ESI) for Lab on a Chip.

Open-channel microfluidic chip based on shape memory polymer for controllable liquid transport

Wen-Qi Ye, Xiao-Peng Liu, Ruo-Fei Ma, Chun-Guang Yang, Zhang-Run Xu*

Research Center for Analytical Sciences, Northeastern University, Shenyang, 110819, China.

*Corresponding author: Tel.: +86-24-83687659; E-mail: xuzr@mail.neu.edu.cn.

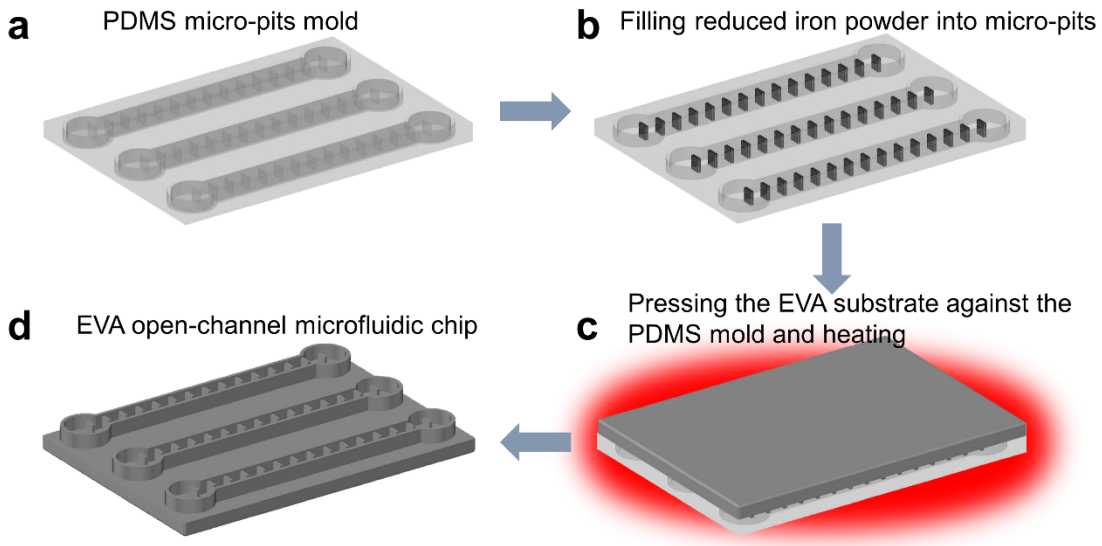

Fig. S1 Fabrication process of the open-channel microfluidic chip. (a) PDMS mold with micro-pit arrays. (b) Filling reduced iron powder into micro-pits. (c) Pressing the EVA substrate against the PDMS mold and thermoforming by heating. (d) The open-channel microfluidic chip obtained by removing the EVA substrate from the PDMS mold.

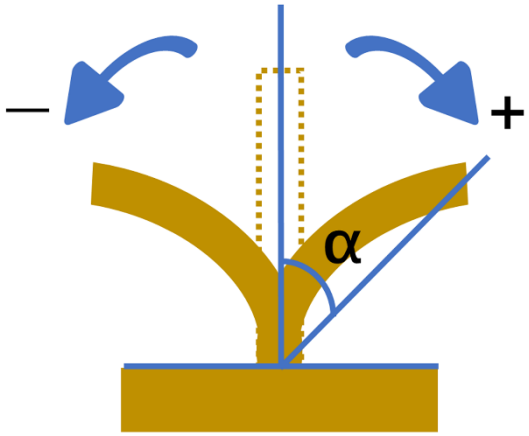

Fig. S2 Schematic diagram of the bending angle of microcolumn.

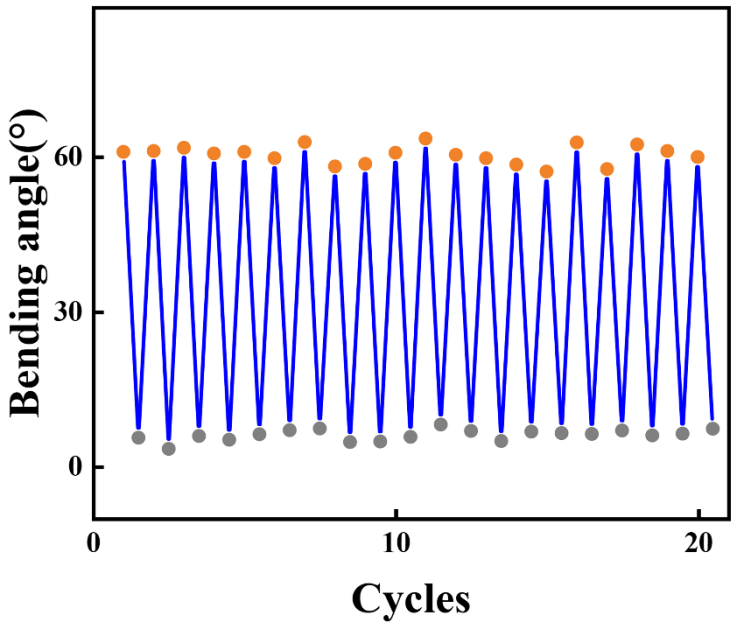

Fig. S3 20 cycles of magnetic-induced tilt and laser-induced recovery to show the reusability of the microcolumn.

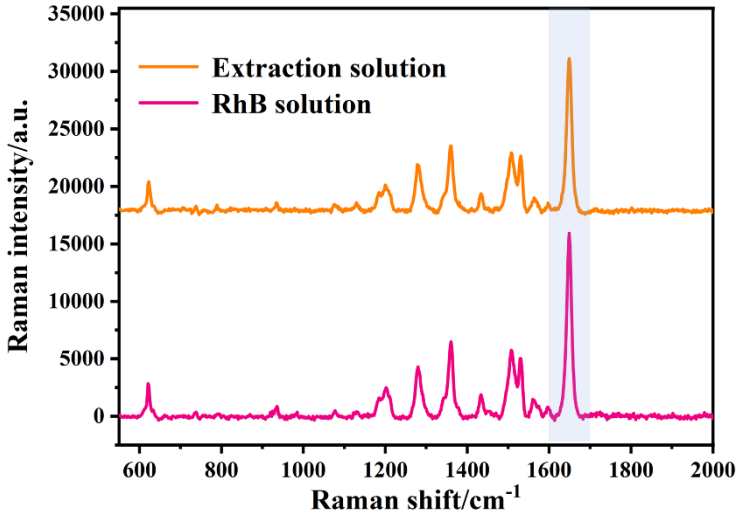

Fig. S4 Raman spectra of 500 μM RhB solution and extraction solution. A total of 3 μL RhB droplet was extracted with 20 μL of n-hexanol in the open channel, and the n-hexanol solution containing RhB was concentrated to about 3 μL and then dropped onto SERS substrate. In addition, 3 μL of RhB droplet (500 μM) was added to another SERS substrate. Their Raman spectra were measured after they were completely evaporated. The extraction rate was calculated based on the ratio of Raman intensity at 1649 cm^{-1}.

Supplementary video

Video S1: Deformation and recovery of microcolumns controlled by NIR laser.