Supporting Information

A general strategy for printing colloidal nanomaterials into one-dimension micro/nanolines

Yifan Li[a]‡, Zeying Zhang[ab]‡, Meng Su[a], Zhandong Huang[a], Zheng Li[ab], Fengyu Li[a], Qi Pan[ab], Wanjie Ren[a], Xiaotian Hu[ab], Lihong Li[a] and Yanlin Song*[a]*

[a]Key Laboratory of Green Printing, Institute of Chemistry, Chinese Academy of Sciences (ICCAS), Beijing Engineering Research Center of Nanomaterials for Green Printing Technology, Beijing National Laboratory for Molecular Sciences (BNLMS), Beijing 100190, P. R. China

[b]University of Chinese Academy of Sciences, Beijing, 100049, P. R. China

*Meng Su, E-mail: sumeng1988@iccas.ac.cn

*Yanlin Song, E-mail: ylsong@iccas.ac.cn

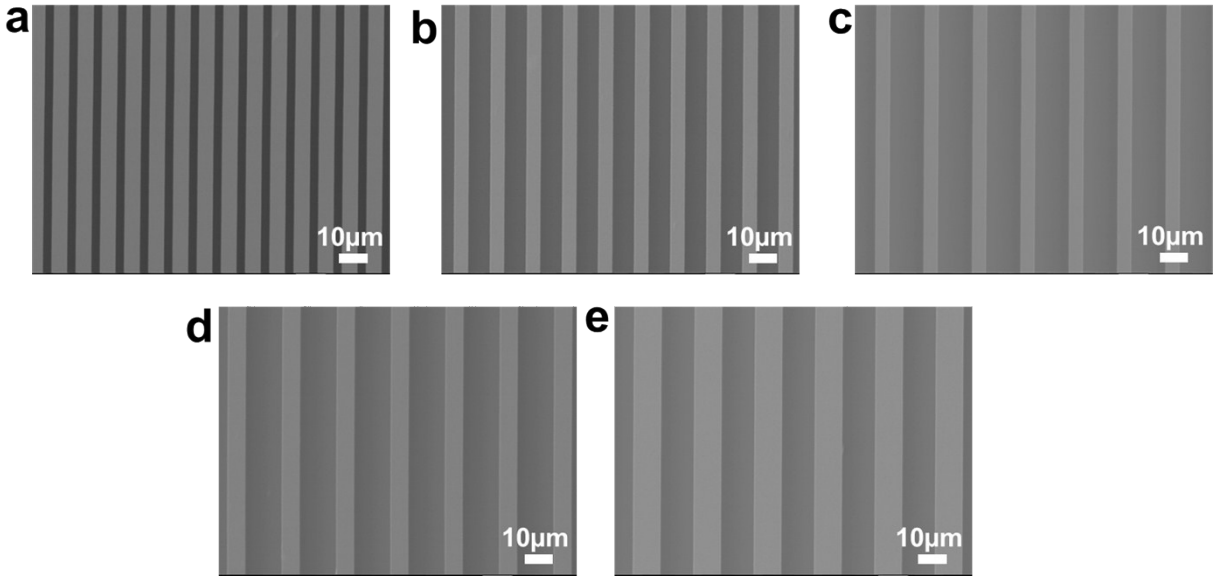


Figure S1. Diverse microwall design. a-c) SEM images of microwalls with width of 4 μm and spacing of a) 2 μm, b) 4 μm, c) 12 μm. d-e) SEM images of microwalls with width of d) 6 μm and e) 12 μm.

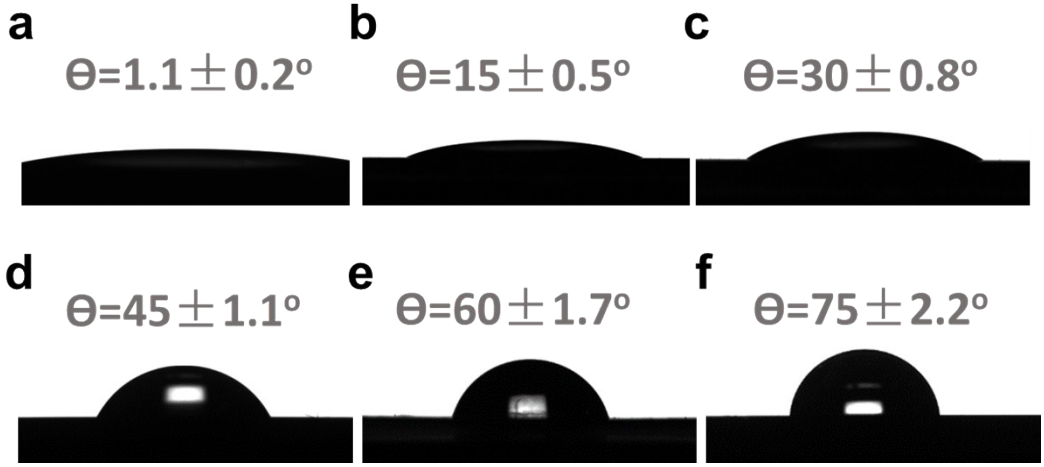


Figure S2. Substrates with different θ. a-f) The side profile of a sessile droplet on substrate with a) θ=1.1°±0.2°, b) θ=15°±0.5°, c) θ=30°±0.8°, d) θ=45°±1.1°, e) θ=60°±1.7°, f) θ=75°±2.2°.

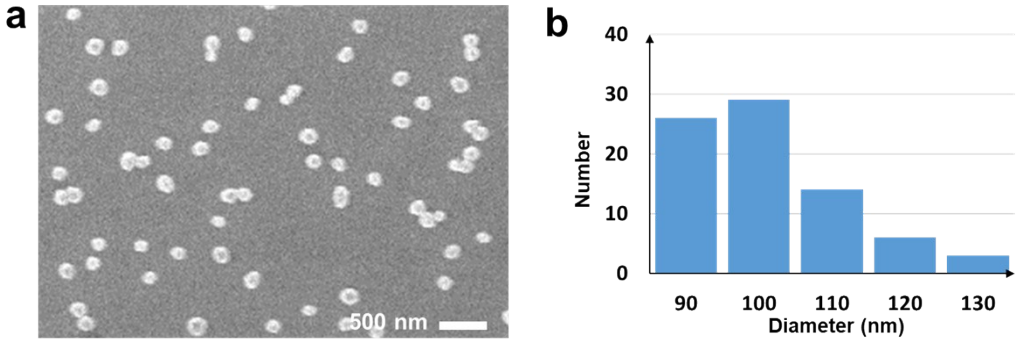


Figure S3. Uniform AgNPs prepared through a wet chemical strategy [1]. a) Top view SEM image of generated AgNPs upon a pre-clean flat silicon substrate, showing their average size is 100±9 nm. b) Statistical size distribution of AgNPs from 100 samples in the SEM observation.

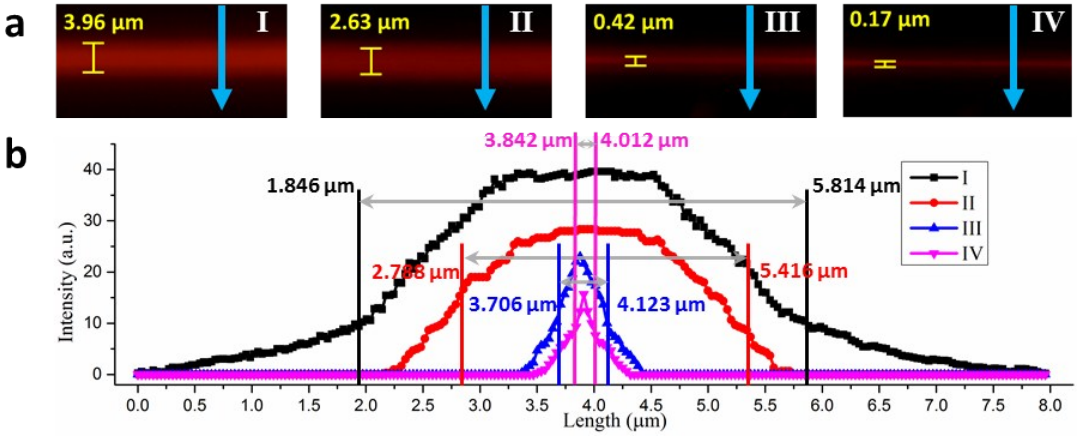


Figure S4. The calculated widths of liquid bridges from the fluorescence microscope images. a) Fluorescence microscope images of liquid bridges before the complete evaporation are used to calculate the width via the ImageJ. The blue arrows indicate the direction of the intensity investigation. b) The investigated intensities of fluorescence images (I, II, III, IV) along the blue arrows. The locations at which intensities suddenly increase and decrease are indicated with different color lines corresponding to the images I, II, III and IV. The liquid bridge widths are calculated from the length between the suddenly increased and decreased intensities.

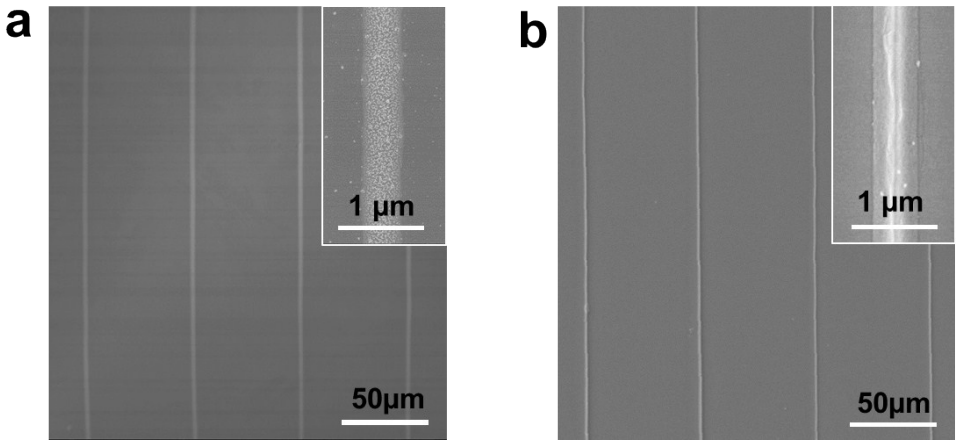
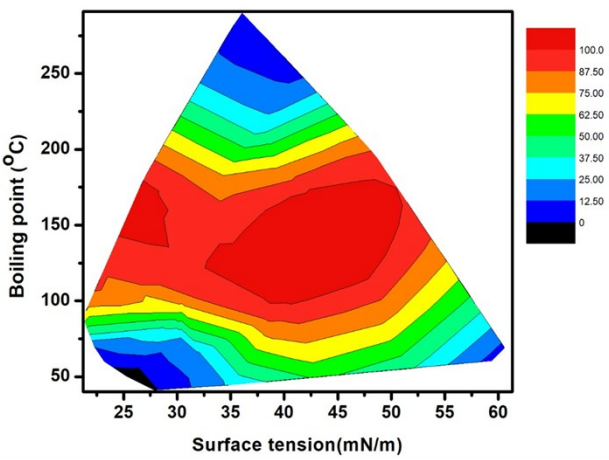


Figure S5. The diversity of printed materials. a-b) SEM images of printed a) AuNPs and b) PEDOT microlines. The insert in a) and b) is the magnified morphology of 1D microline.

a



b

	Surface tension(mN/m)	Boiling point(℃)	ratio(%)
Isopropyl acetate	21.2	89	70
Isopropanol	21.7	82.5	60
Ethanol	22.27	78.3	20
Methanol	22.55	64.65	10
Isobutanol	23	107	90
acetone	23.7	56.1	0
Isobutyl acetate	23.7	118.3	90
Ethyl acetate	23.75	77	20
Propanol	23.8	97.2	80
Methyl isobutyl ketone	23.9	118	90
Methyl acetone	23.97	80	20
N-propyl acetate	24.2	101.6	90
Butanol	24.6	117	90
Butanone	24.6	79.6	60
Butyl acetate	25.09	126	95
Carbon tetrachloride	26.1	76.54	5
Dichloromethane	28.16	40	0
benzene	28.18	80.1	20
Toluene	28.4	110.6	100
O-dichlorobenzene	26.84	180.4	100
O-xylene	30	144.4	100
Xylene	31	140	80
chlorobenzene	33.1	132.2	100
Glycerol	36	290.9	10
Ethyl salicylate	38.33	231	10
Dibromomethane	39.8	96	100
Dimethyl sulfoxide	43.6	189	90
Ethylene glycol	48.4	197.3	90
Chloroform	61.3	61.7	0

Figure S6. The versatility of the printing method for a wide range of organic solvents. a) The dependence of 1D micro/nanolines on the surface tension and boiling point of the organic solvents. b) The ratio of successful preparation of 1D micro/nanolines printed by using diverse organic solvents.

Table S1. The 1D micro/nanolines with single-particle resolution printed on the substrate with different θ in 0.01%AgNPs concentration.

Contact angle (°C)	30	45	60
1D width (μm)	0.04±0.01	0.05±0.02	0.03±0.01

Table S2. The 1D micro/nanolines with single-particle resolution printed by diverse microwalls in 0.01% AgNPs concentration.

Template width (μm)	4	6	8	10	12
1D width (μm)	0.05±0.02	0.03±0.01	0.04±0.02	0.03±0.02	0.05±0.02

Reference

1. P. Y. Silvert, R. HerreraUrbina and K. TekaiaElhsissen, *Journal of Materials Chemistry*, 1997, **7**, 293.