Supporting information

Mask-less soft lithography for fabricating micro- and nanoscale Ag structures *via* solid-state electrochemical etching using polymer electrolyte membrane for optoelectronic and sensing applications

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Keywords: nano-patterning, imprint lithography, solid-state electrochemical etching, polymer electrolyte membrane, flexible transparent electroconductive membrane, SERS

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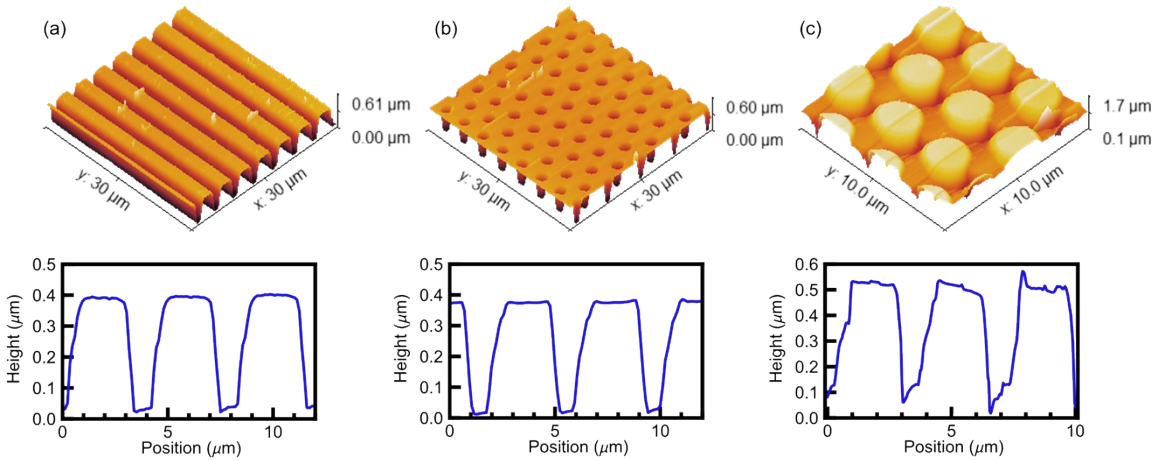

Fig. S1 AFM observations of the master molds containing (a) line and space (L&S), (b) pillar, and (c) hole structures with a pattern resolution of 2 µm

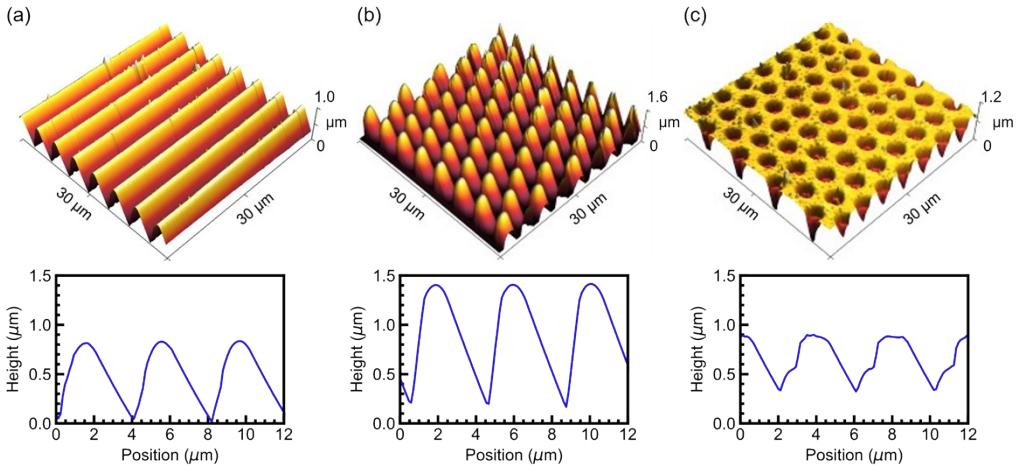

Fig. S2 AFM observations of the prepared PEM stamps containing (a) L&S, (b) pillar, and (c) hole structures with a pattern resolution of 2 μm

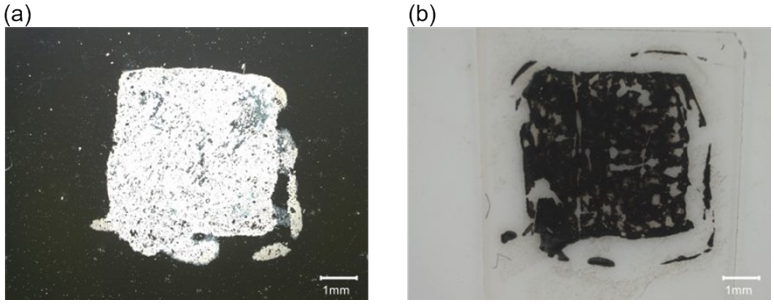

Fig. S3 Optical micrographs of (a) the Ag surface and (b) the PEM after the electrochemical measurement. The Ag thin film was almost completely removed from the substrate in the contact area with the PEM.

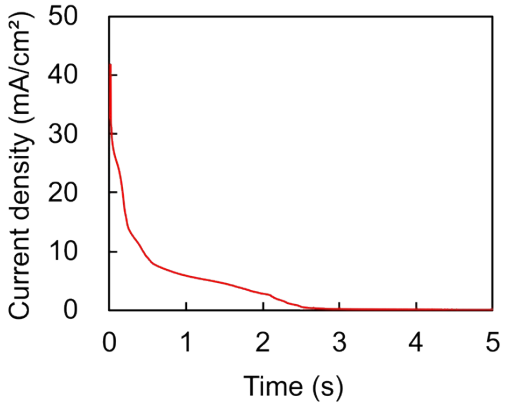

Fig. S4 Chronoamperometry (CA) profile of the solid-state electrochemical etching using the wet PEM stamp (2 μm hole) under a bias voltage of 1.2 V.

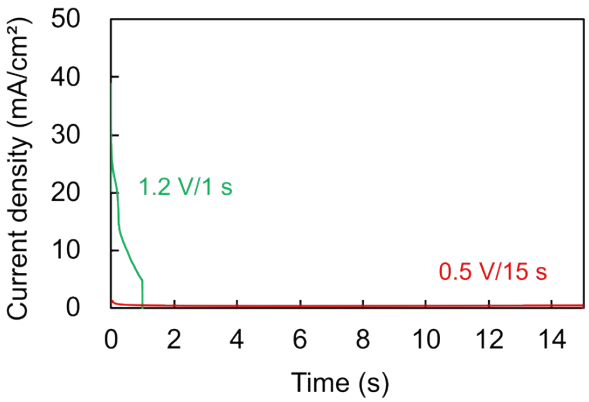

Fig. S5 Dependence of the electrolytic bias voltage on the CA profile.

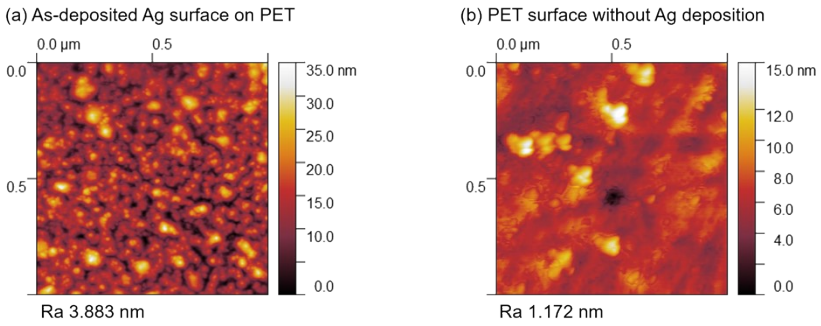

Fig. S6 AFM images of (a) as-deposited Ag surface on PET and (b) PET surface without Ag deposition.