Electronic Supplementary Material (ESI) for Soft Matter.

Supplementary Information

Micropatterned Elastomeric Surface with Enhanced Frictional Properties under Wet Conditions and Its Application

Hangil Ko, Minho Seong and Hoon Eui Jeong*

Department of Mechanical Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan 44919, Republic of Korea

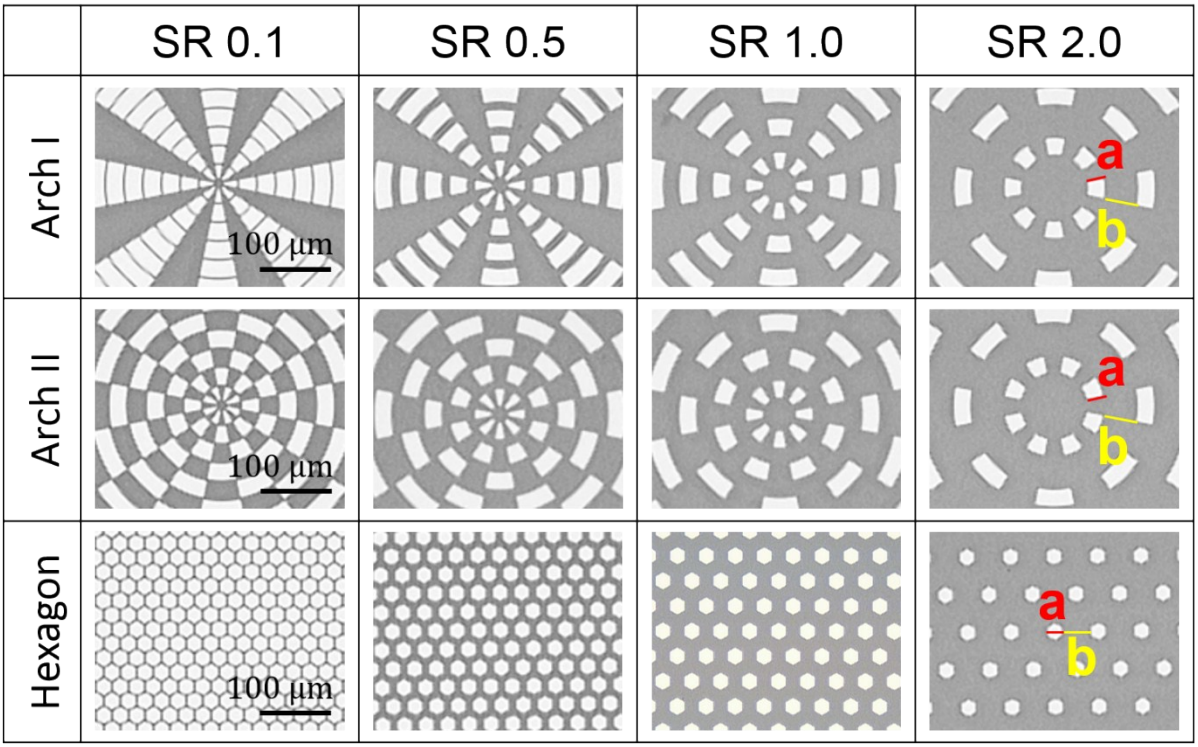

Figure S1. Opical microscopic images of micropatterned surfaces. Varying parameters including SR (0.1, 0.5, 1.0 and 2.0) and pattern type (AI, AII, and H) are indicated in tabular form. The width of a single micropillar and spacing between adjacent micropillars are indicated in a and b, respectively.

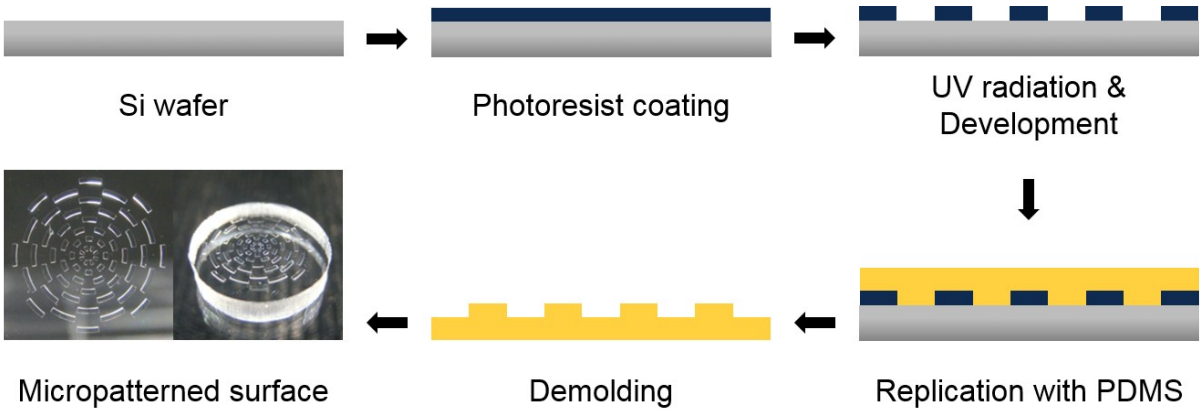

Figure S2. Fabrication procedure of micropatterned surfaces by photolithography and replica molding with PDMS.

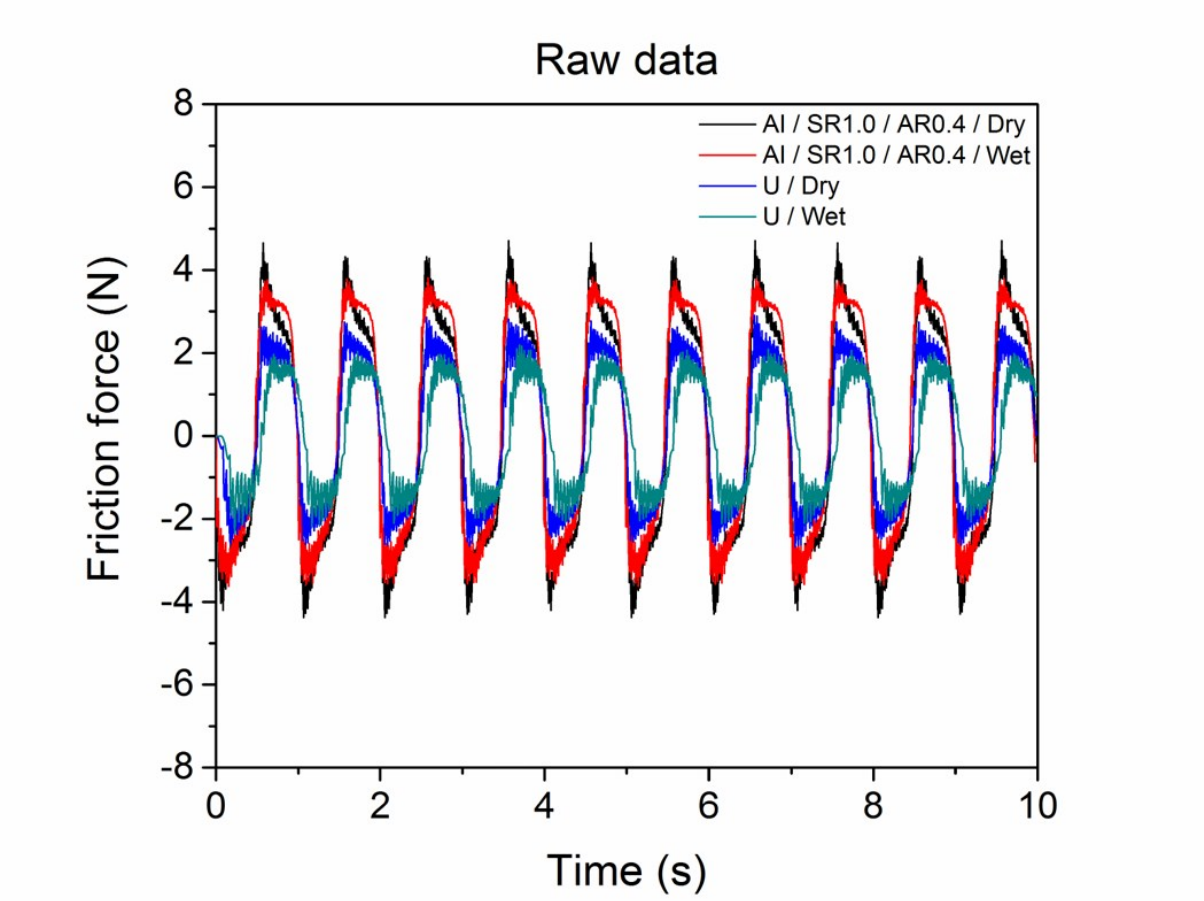

Figure S3. Cyclic measurement of friction force for 10 cycles. Friction forces of unpatterned and micropatterned surfaces (AI with SR: 1.0 and AR: 0.4) are uniformly recorded under dry and wet conditions.

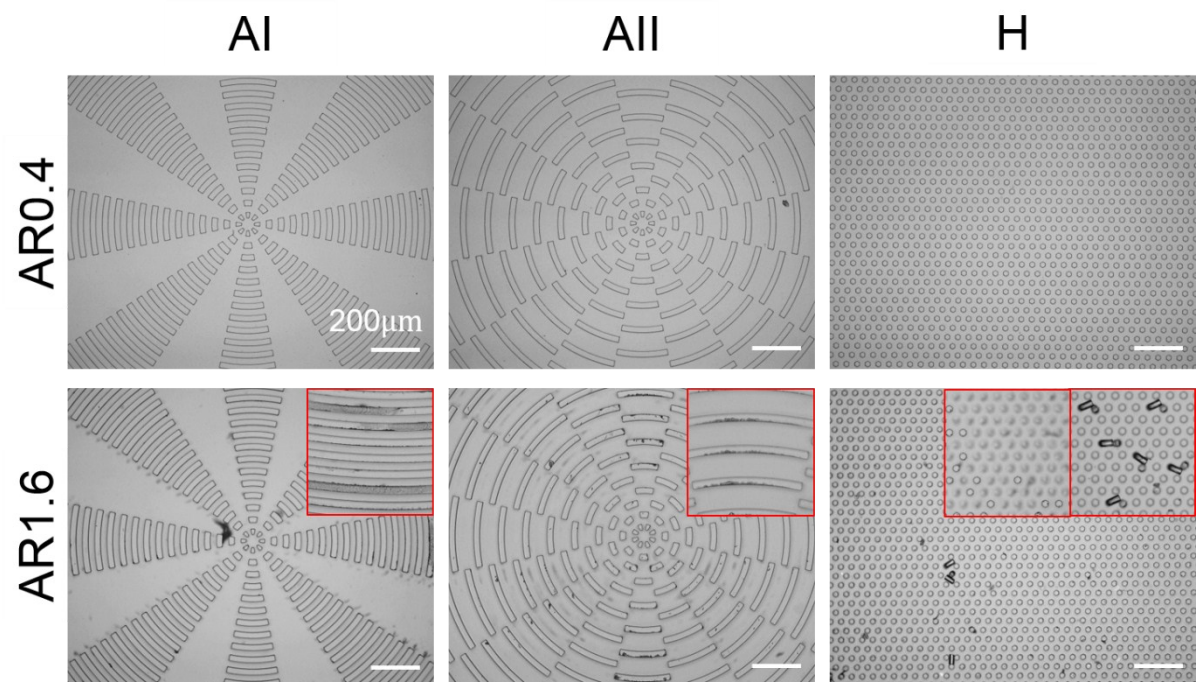

Figure S4. Optical microscopic images showing the surface of three different micropatterns (AI, AII and H, SR of 1.0) with low and high ARs (0.4 and 1.6) after friction tests of 3000 cycles (load: 2 N, velocity: 10mm/s). Insets show the deformed microstructures after repeated measurement tests.

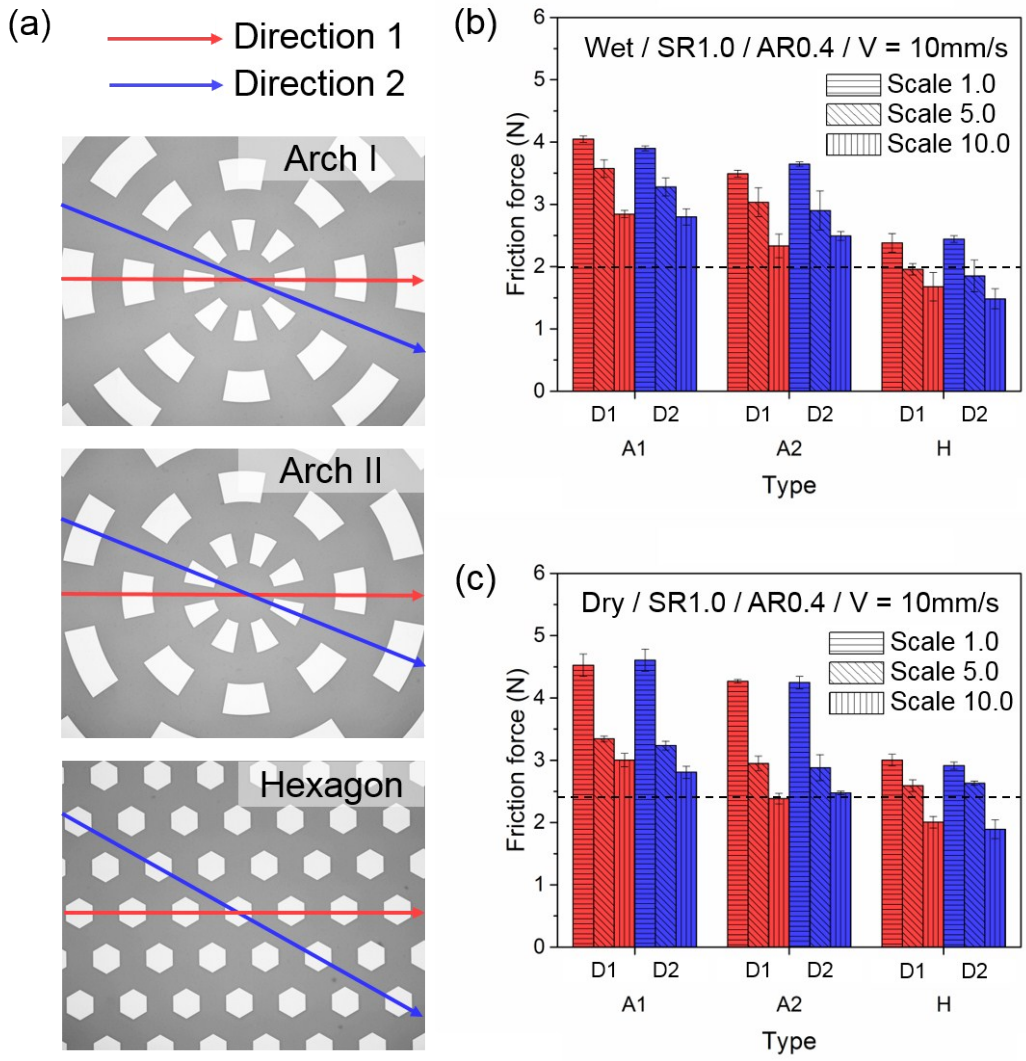

Figure S5. (a) Images showing two different shear directions of D1 and D2 for AI, AII and H micropatterns. Friction forces for micropatterned surfaces with varying scales of 0.1, 0.5 and 1.0 (SR: 1.0, AR: 0.4 and velocity: 10mm/s) under (b) wet and (c) dry conditions.

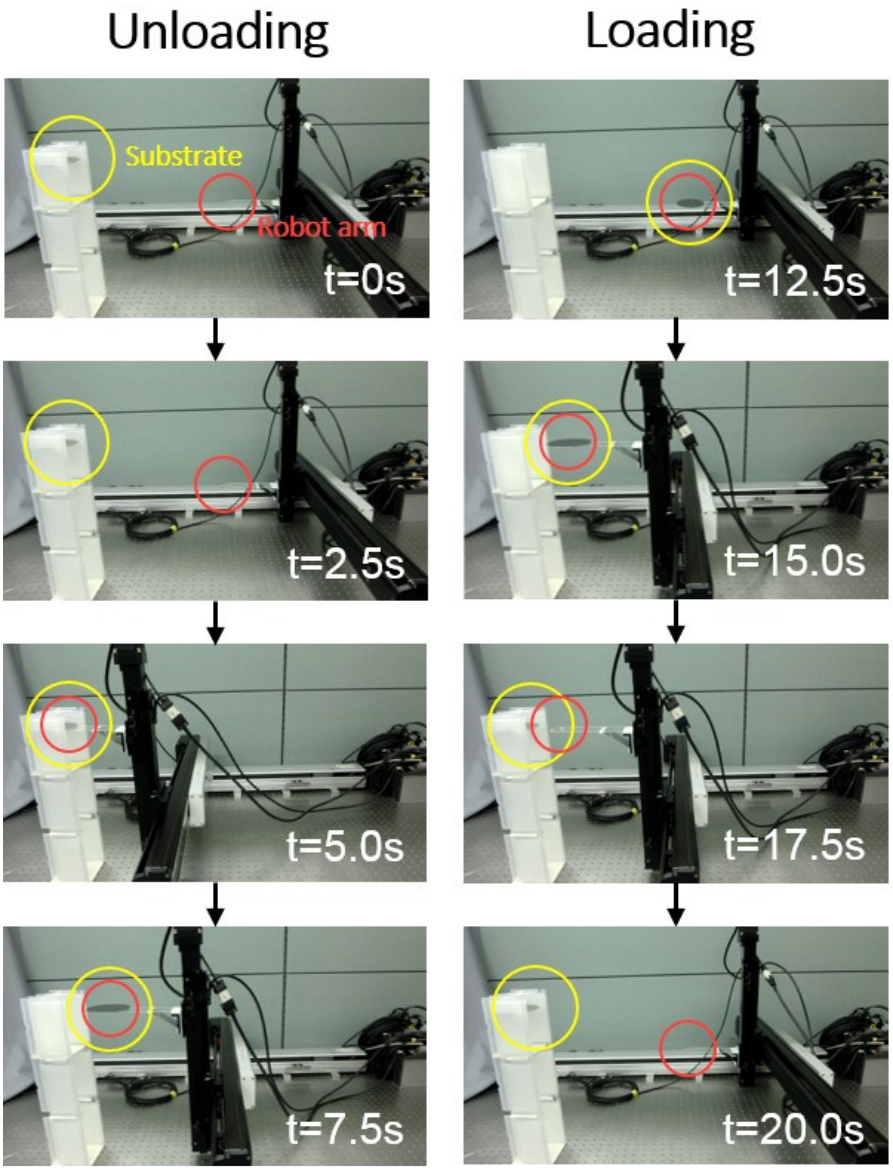

Figure S6. Time lapse images showing stable unloading, loading, and transfer of substrate using micropatterned surfaces on the robot arm of the three-axis stage.

Legends of Movies

Movie S1: Comparison of stability between micropatterned surfaces (AI, AII and H with AR = 0.4 and SR = 1.0) and unpatterned surfaces during high-speed substrate transfer (Frequency: 5Hz, Stroke: 15mm).

Movie S2: A movie showing stable unloading, loading, and transfer of substrate using micropatterned surfaces on the robot arm of the three-axes stage.