Supplemental Information

Environmentally friendly Repeatable Adhesion Utilizing Sulfobetaine-type Polyzwitterion Brush

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1. XPS analysis of poly(MAPS) brush

X-ray photoelectron spectroscopy (XPS) was performed at a 45° take-off angle on an XPS-APEX instrument (Physical Electronics Co. Ltd.) with a monochromatic Al–*K*α x-ray source at a power of 150 W and a pressure of 1×10^{-6} Pa.

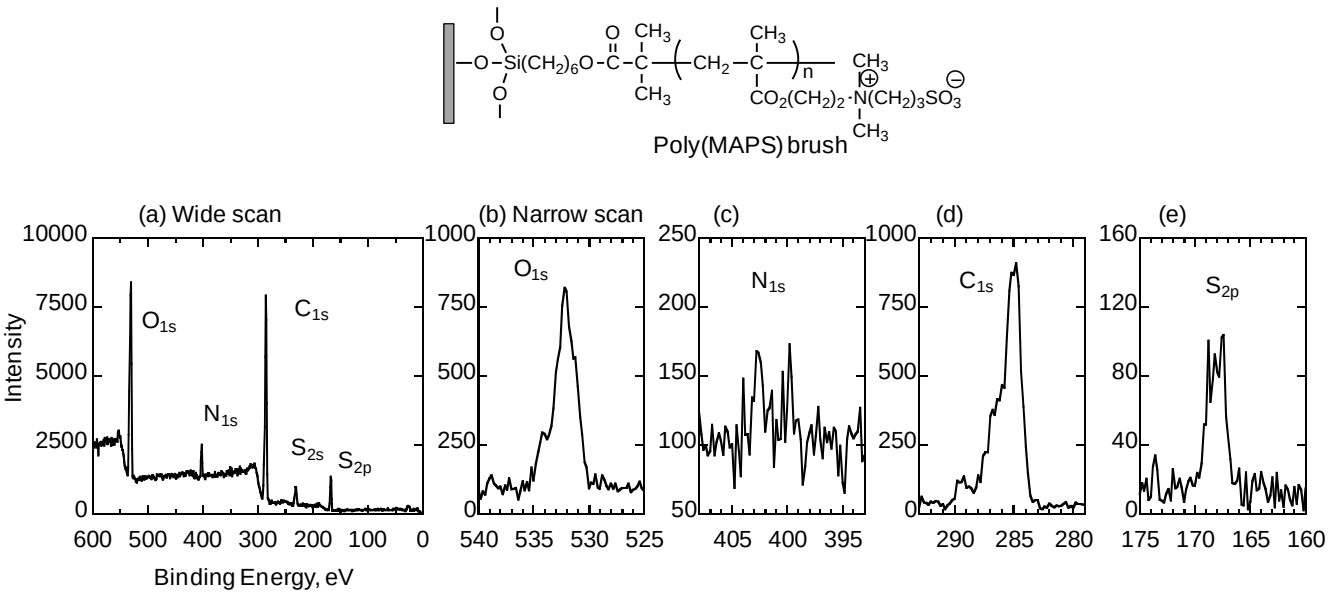

Fig. S1. XPS spectra of (a) wide scan and narrow scan of (b) O_{1s}, (c) N_{1s}, (d) C_{1s}, (e) S_{2p}, of poly(MAPS) brush.

Table S1. Atomic ratio of poly(MAPS) brush

	O_{1s}	N_{1s}	C_{1s}	S_{2p}
Obs.	0.253	0.052	0.651	0.044
Theoretical	0.278	0.055	0.612	0.055

2. UCST

Cloud point of the poly(MAPS) aqueous solution (1.0 wt%) was determined by UV-vis measurement using Lambda 35 (Perkin Elmer Japan Co., Ltd.). Fig. S3 shows the temperature dependency of transmittance of light (λ = 500 nm) through the polymer solution. Heating and cooling rate was 1 K/min from 273 K to 333 K.

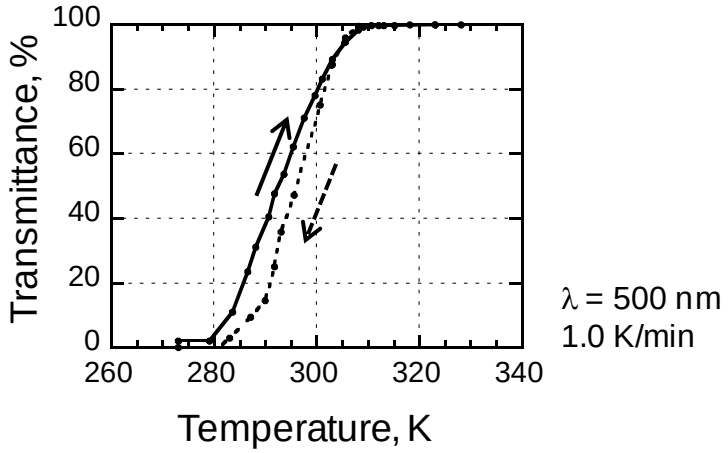

Fig. S2. Transmittance of poly(MAPS) aqueous solution (1.0 wt%) using a visible light (λ = 500 nm). Heating and cooling rate was 1 K/min from 273 K to 333 K. The number-averaged molecular weight of poly(MAPS); M_n = 105,000, M_w/M_n = 1.21.

3. Neutron reflectivity measurements of poly(MAPS) brush/ D_2O interface

NR measurements were carried out surface profile analysis reflectometer (SPEAR), a vertical scattering geometry time-of-flight reflectometer, at the Los Alamos National Laboratory Lujan Neutron Scattering Center (USA). The wavelength of the incident neutrons was tuned to around 0.20-0.90 nm by a disk chopper. The neutron momentum transfer vector is $q = (4\pi/\lambda)\sin\theta$, where θ is the angle of specular reflection. A 30 mm beam footprint was maintained on the sample surface by using incident slits. The MOTOFIT program was used to fit the reflectivity profiles to modeled scattering length density (SLD) layers, in which the thickness of each layer, SLD, and Gaussian roughness were optimized to minimize the χ^2 of the measured and calculated reflectivity curves. The SLD of the deuterium oxide (D_2O), poly(MAPS), SiO_2, and Si used in this study were 6.34×10^{-4}, 0.77×10^{-4}, 3.47×10^{-4}, and 2.07×10^{-4} nm^{-2}, respectively.

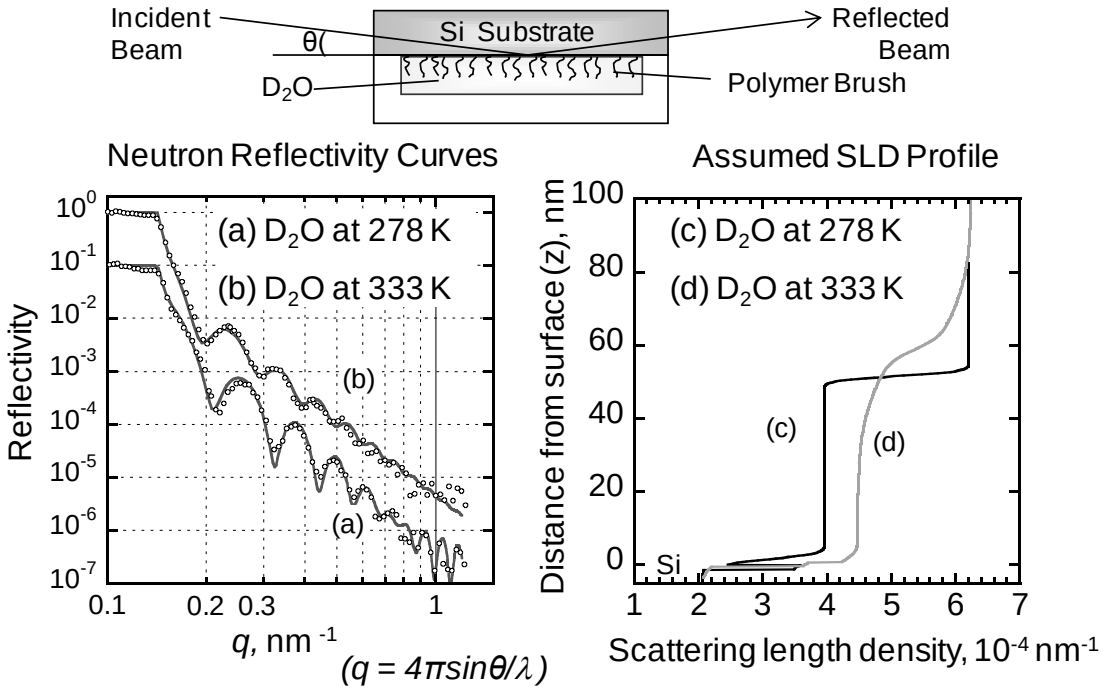

Fig. 3. Neutron reflective curves and fits at the interface of poly(MAPS) brush/ D_2O at (a) 278 K and (b) 333 K, and the corresponding scattering length density profiles of poly(MAPS) brush along the distance from Si substrates at (c) 278 K and (d) 333 K: $q = (4\pi/\lambda)\sin\theta$. M_n of poly(MAPS) = 171000, M_w/M_n = 1.22.