

## Supporting Information

# Mechanochemical Degrafting of Surface-Tethered Poly(Acrylic Acid) Brush Promoted Etching of Its Underlying Silicon Substrate

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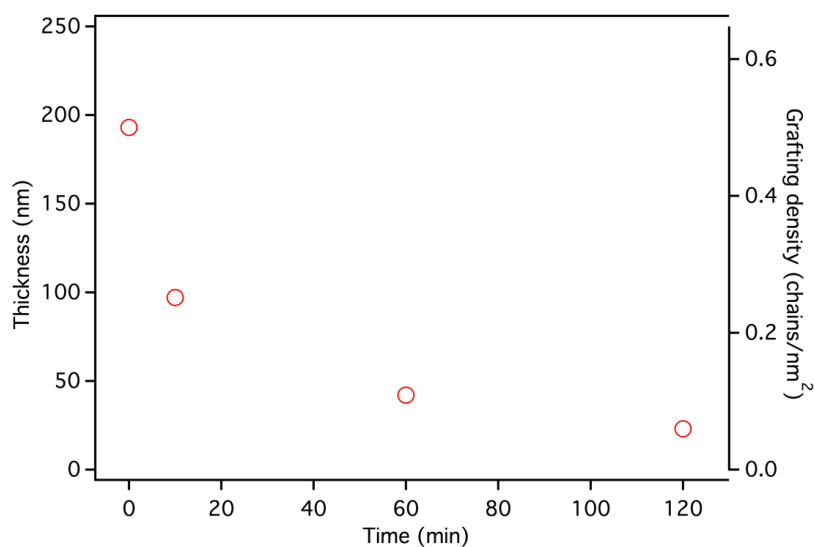
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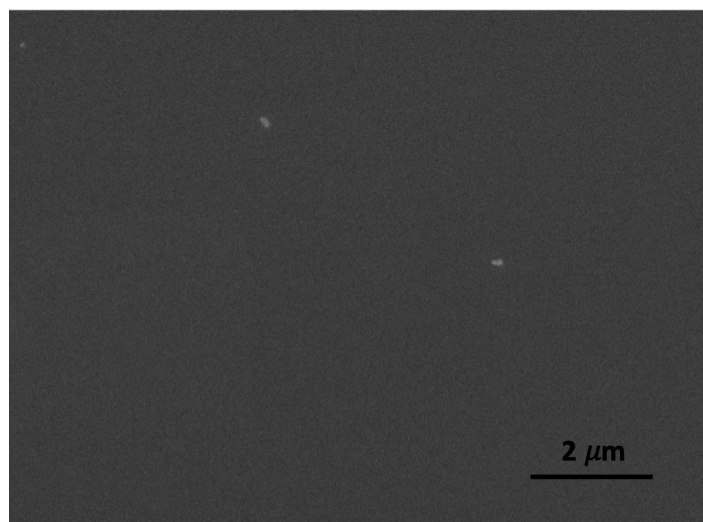
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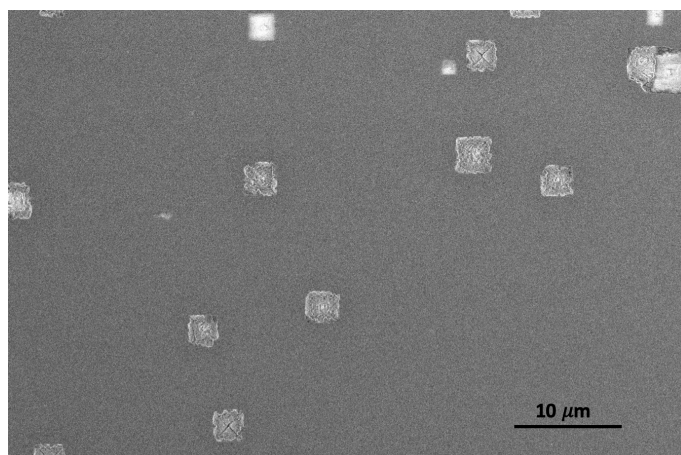
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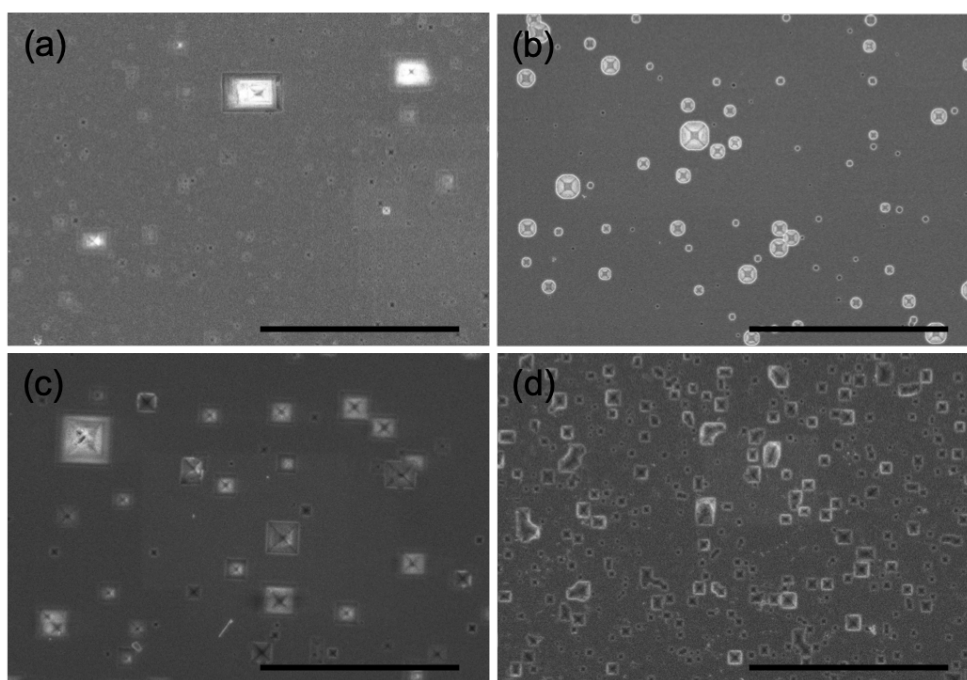
**Figure S1.** Thickness and grafting density of a PtBA brush as a function of the reaction time with 0.05 M TBAF solution in THF at 40°C. The grafting density (proportional to the thickness) was calculated by assuming that the grafting density of the parent PtBA brush specimen was 0.5 chains/nm<sup>2</sup>.



**Figure S2.** SEM image of the silicon substrate of PtBA brush after immersion in 0.05 M TBAF solution in THF at 40°C for 60 minutes and subsequent removal of polymeric grafts by piranha solution.



**Figure S3.** SEM image of the silicon substrate of PAA brush with thickness of 111 nm after incubation in 0.1 M ethanolamine buffer (pH 9.0) with 0.50 M NaCl for 7 days and subsequent removal of the polymeric grafts by piranha solution.



**Figure S4.** Various self-assembled monolayers were incubated in 0.1 M ethanolamine buffer (pH 9.0) with 0.50 M NaCl for 7 days, SEM images of the underlying silicon substrates were taken after removal of the organic grafts by piranha solution: (a) BMPUS, (b) DTCS, (c) OTCS and (d) PTCS. Scale bar = 5  $\mu\text{m}$ .

**Table S1.** Analysis of the etched pits for the underlying silicon substrates of various SAMs after incubation in 0.1 M ethanolamine buffer (pH 9.0) with 0.50 M NaCl for 7 days.

SAM	Thickness <sup>a</sup> (nm)	Size of etched pits <sup>b</sup> (nm)	Number of pits per area <sup>c</sup> ( $\mu\text{m}^{-2}$ )
BMPUS	1.8	197 $\pm$ 218	0.30
DTCS	1.7	214 $\pm$ 149	0.63
OTCS	1.3	416 $\pm$ 222	0.45
PTCS	1.2	221 $\pm$ 87	2.59

<sup>a</sup> Initial dry thickness measured by spectroscopic ellipsometry; <sup>b</sup> average size measured by SEM; <sup>c</sup> number density of etched pits measured by SEM.