

Supplementary Information

Cyclosiloxane polymer bearing dynamic boronic acid: synthesis and bottom-up nanocoating

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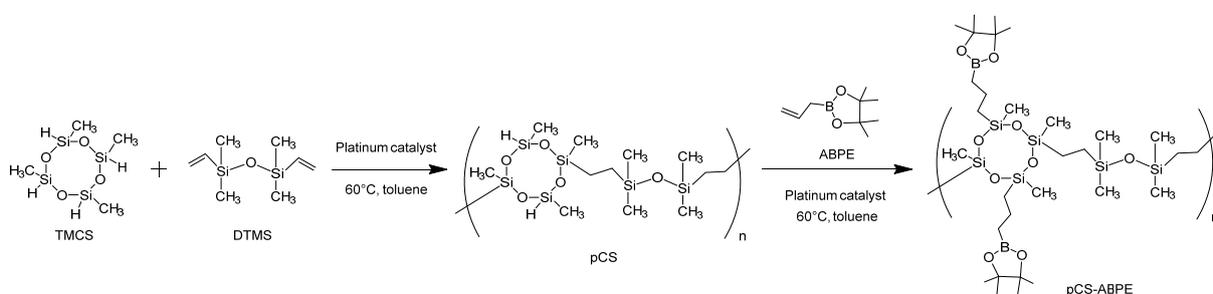


Fig. S1 One-pot synthetic route of pCS-APBE.

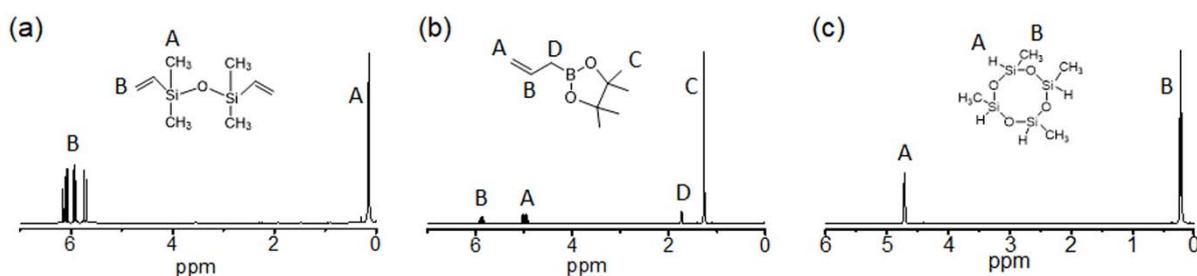


Fig. S2 ^1H NMR spectra of monomers (a) DTMS (b) ABPE and (c) TMCS.

^1H NMR (400 MHz, CDCl_3) of DTMS: δ 0.086 (m, 12H, $\text{CH}_3\text{-Si}$), 5.691 – 6.163 (m, 6H, $-\text{CH}=\text{CH}_2$).

^1H NMR (400 MHz, CDCl_3) of ABPE: δ 0.116 (s, 12H, $\text{CH}_3\text{-C}$), 0.629 (d, 2H, $-\text{CH}_2\text{-B}$), 3.802 – 3.925 (m, 2H, $-\text{CH}_2=\text{CH}$), 4.708 – 4.752 (m, 1H, $-\text{CH}-\text{CH}_2$).

^1H NMR (400 MHz, CDCl_3) of TMCS: δ 0.2339 (m, 12H, $\text{CH}_3\text{-Si}$), 4.725 (m, 4H, Si-H).

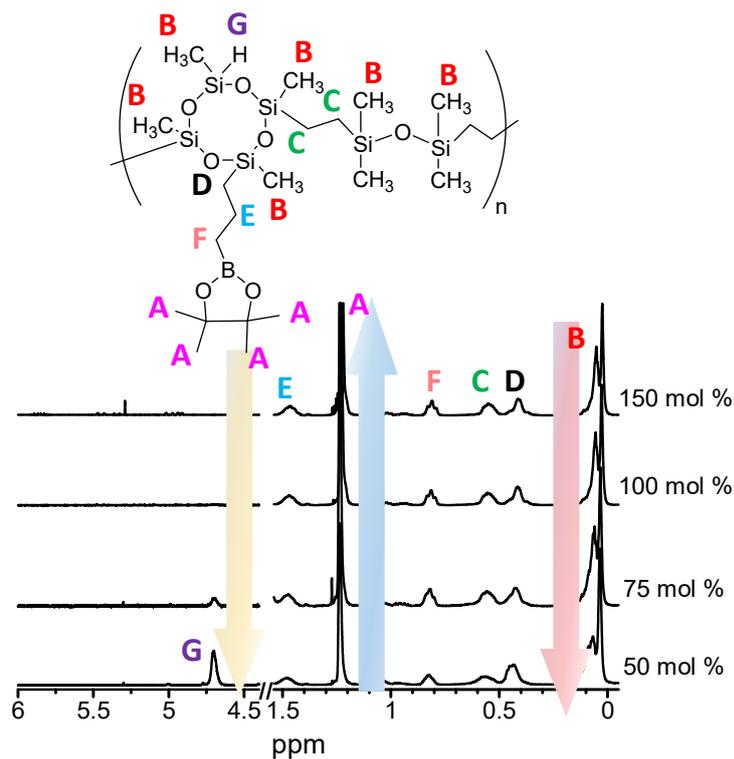


Fig. S3 ^1H NMR spectra of polycyclosiloxane with different feeding ratio of ABPE to the remaining $-\text{Si}-\text{H}$ group in TMCS repeating units.

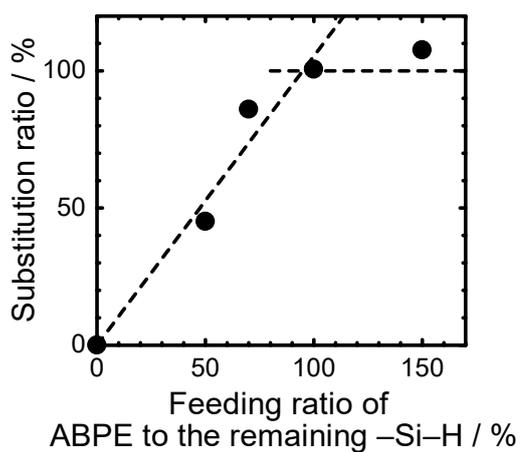


Fig. S4 Correlation between the conversion ratios in ^1H NMR as a function of the feeding ratio of ABPE to the remaining $-\text{Si}-\text{H}$ groups in the polycyclosiloxane.

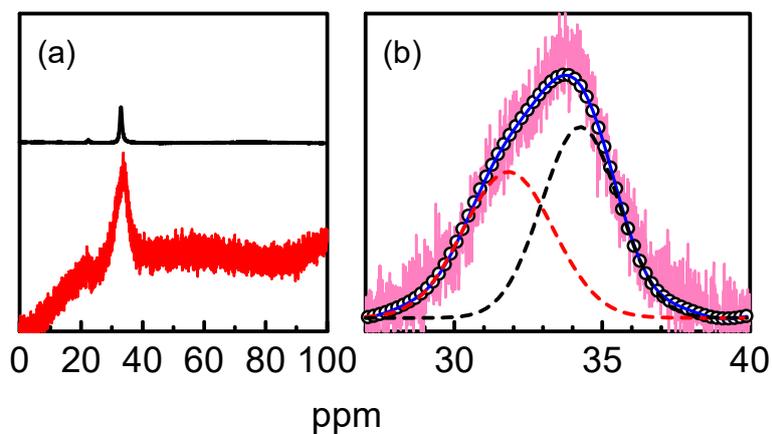


Fig. S5 (a) ^{11}B NMR spectra of ABPE (black) and pCS-AB (red) and (b) deconvoluted ^{11}B NMR spectra of pCS-AB (27-40 ppm): baseline adjust (pink), smoothed curve (blue), best fit curve (black open circle) with the sum of the two Gaussian functions from deprotected boronic acid (red broken line) and protected boronic acid (black broken line).



Fig. S6 Photograph of a pCS-ABPE dip-coating film on a Si substrate.

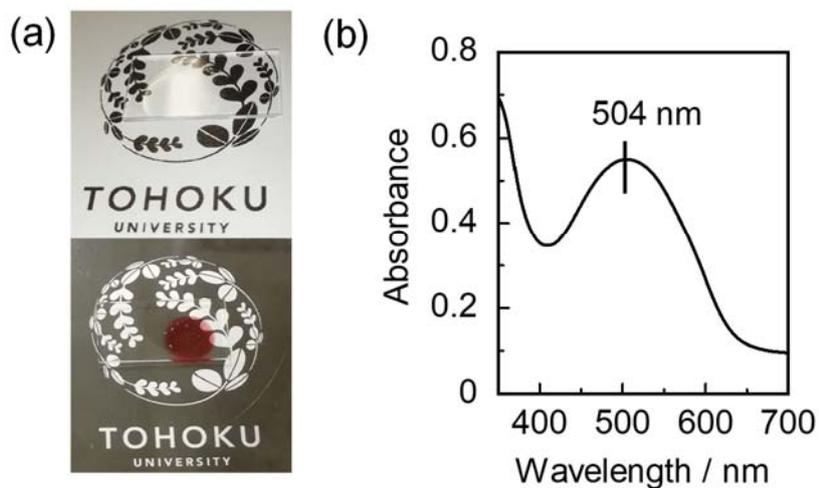


Fig. S7 (a) Photographs of (top) pCS drop-cast film on a quartz substrate, and (bottom) ARS drop-cast film on the pCS surface, and (b) UV-vis absorption spectrum of the pCS-ARS drop-cast film.