Supporting information for

Hybrid polyurethanes composed of isobutyl-substituted open-cage silsesquioxane in the main chains: Synthesis, properties, and surface segregation in a polymer matrix

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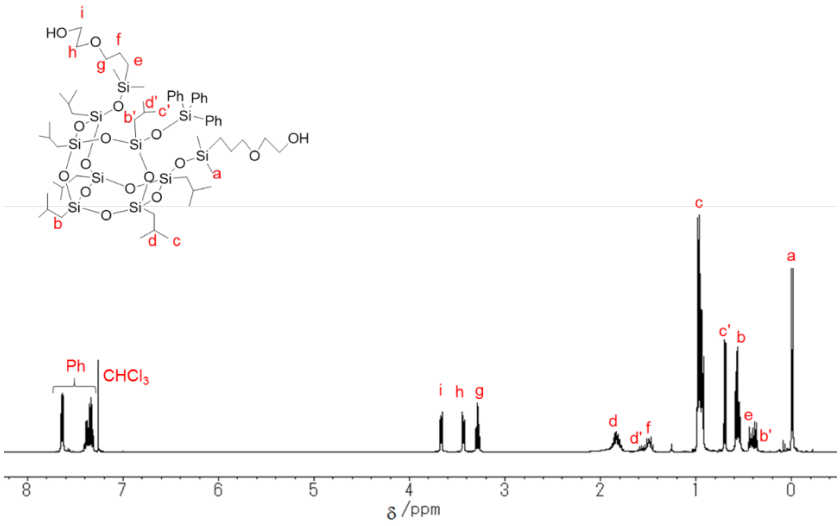
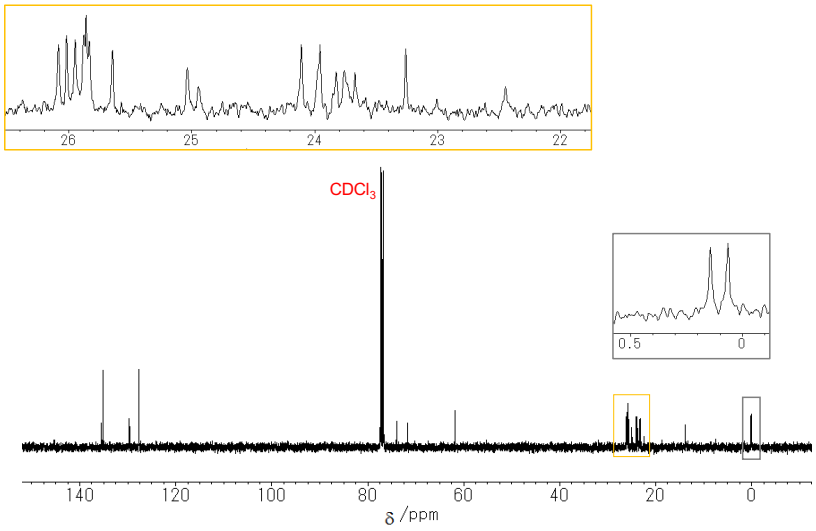
(a)



(b)



(c)

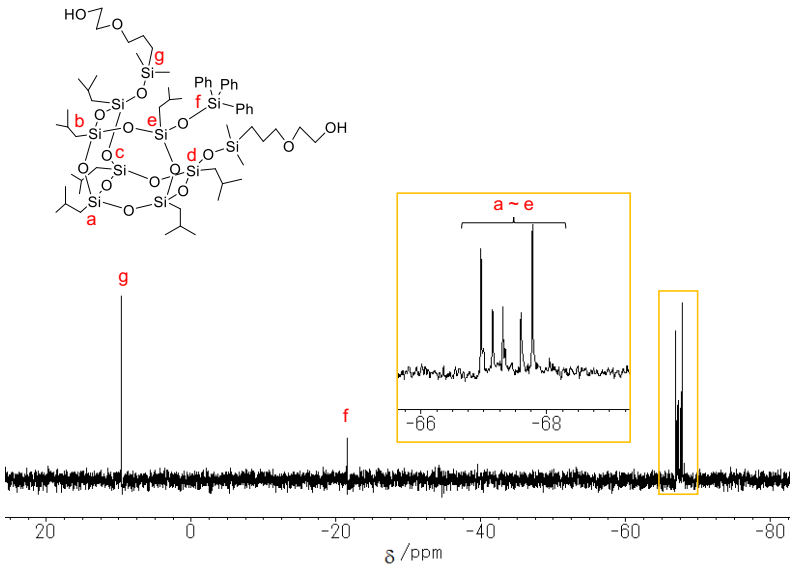


Figure S1 (a) ^{1}H-, (b) ^{13}C-, and (c) ^{29}Si-NMR spectra of **2** in $CDCl_3$.

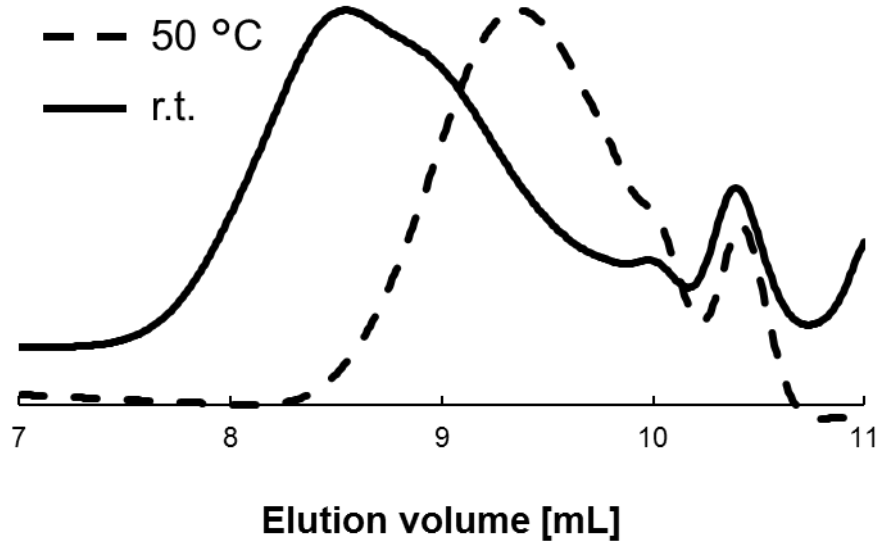


Figure S2 SEC traces of crude **4b** polymerized at 50 ˚C and r.t.

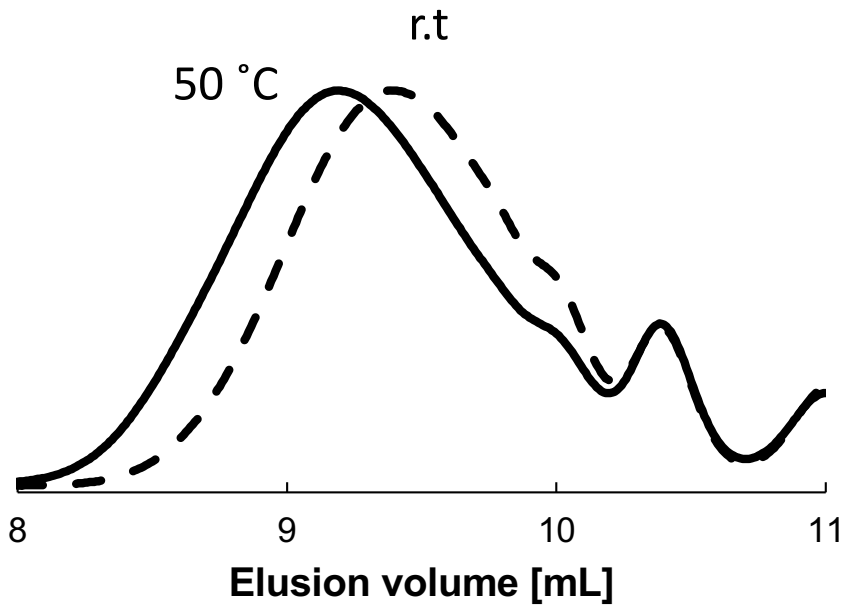


Figure S3 SEC traces of crude **4a** polymerized at 50 ˚C and r.t.

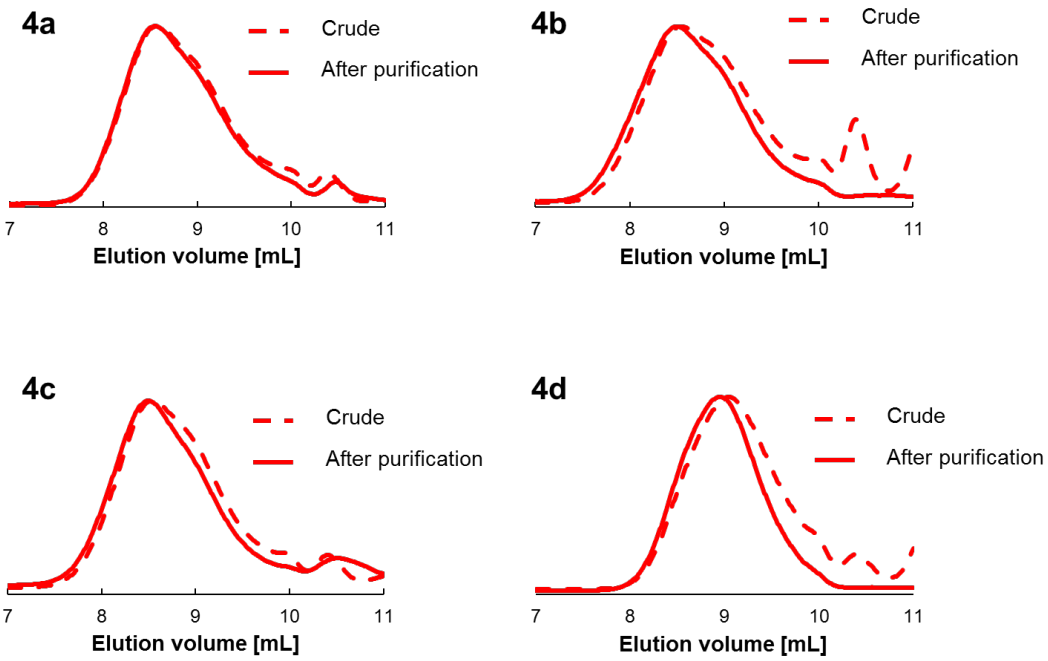
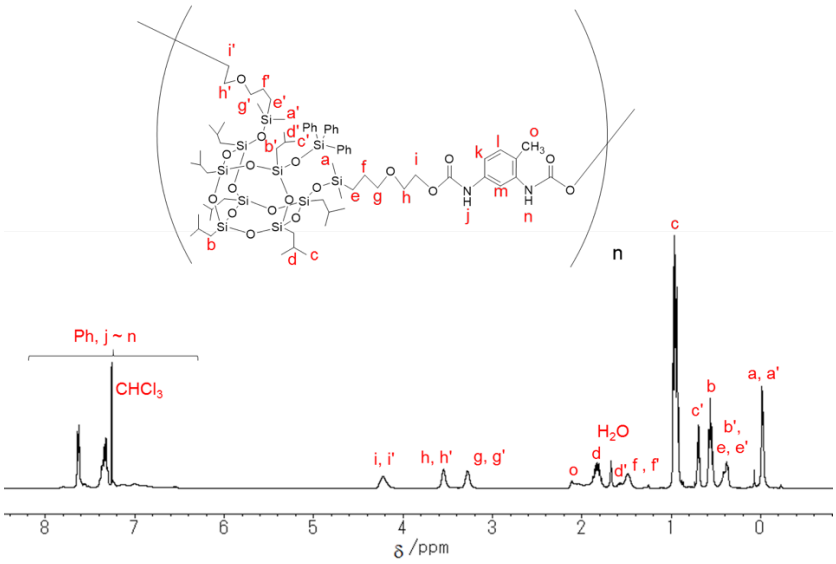
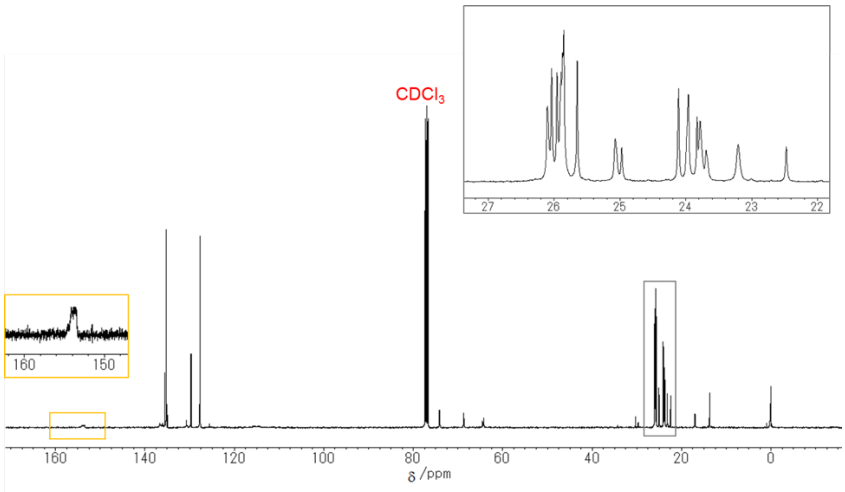


Figure S4 SEC traces of **4a**, **4b**, **4c**, and **4d** before and after the purification.

(a)



(b)



(c)

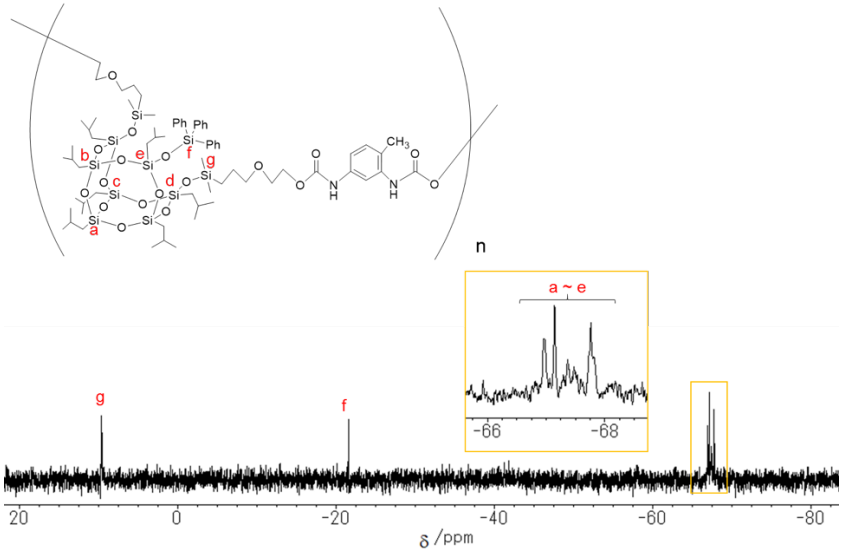
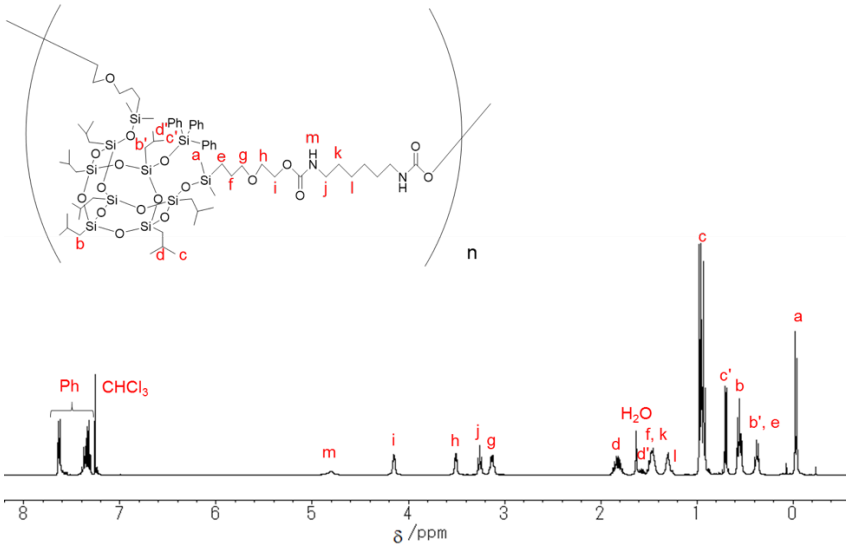
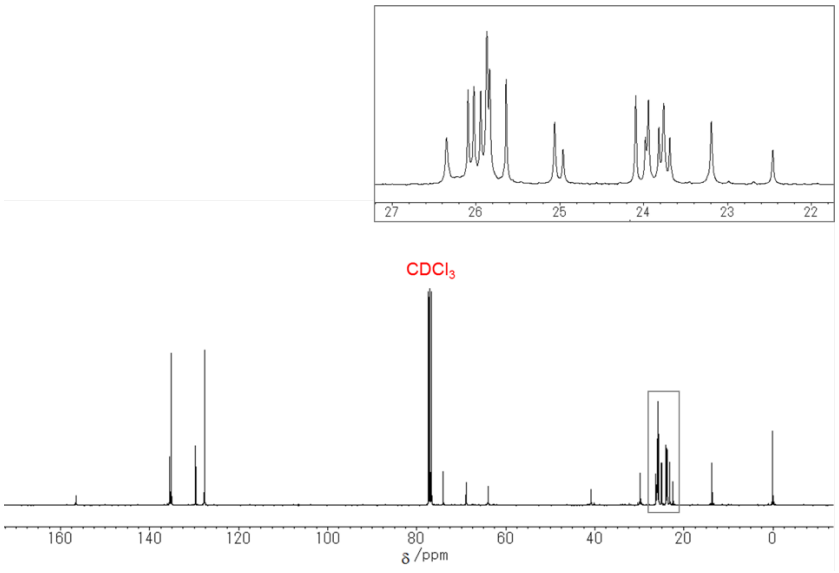


Figure S5 (a) ^{1}H-, (b) ^{13}C-, and (c) ^{29}Si-NMR spectra of **4a** in $CDCl_3$.

(a)



(b)



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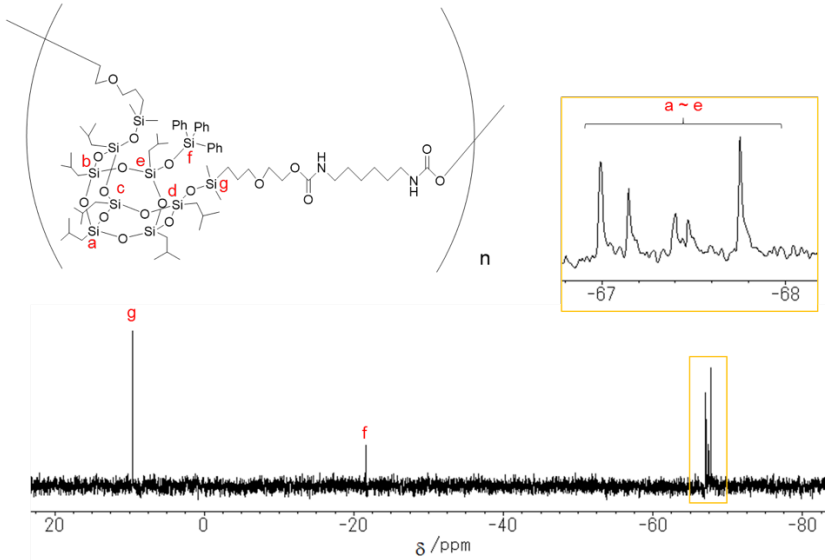
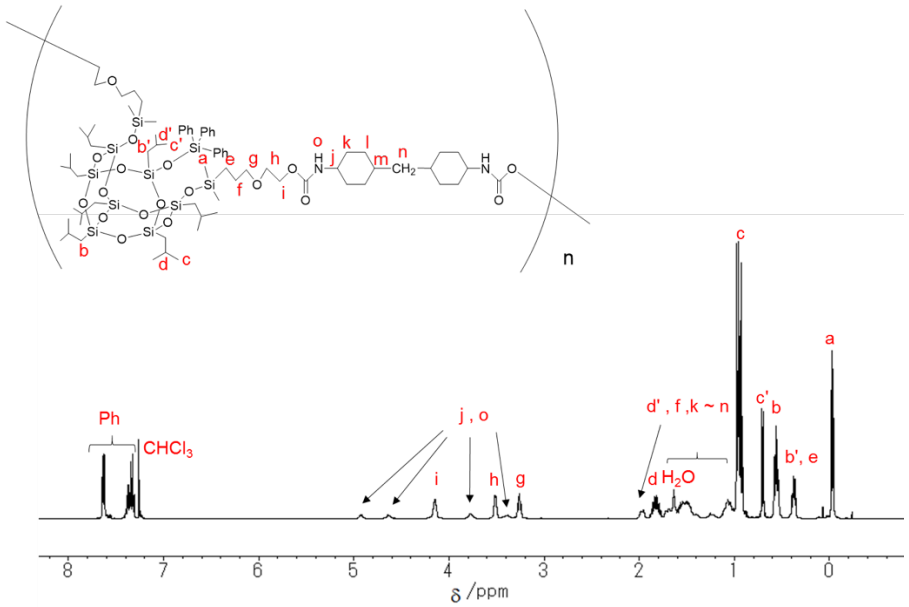
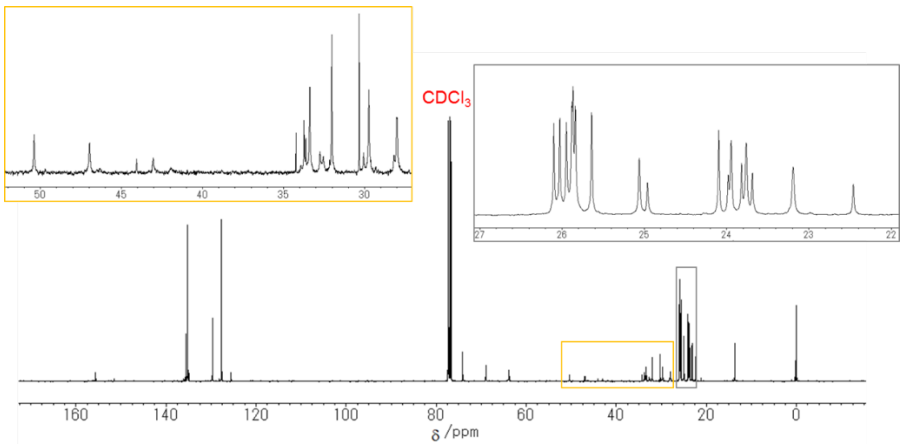


Figure S6 (a) ^{1}H-, (b) ^{13}C-, and (c) ^{29}Si-NMR spectra of **4b** in $CDCl_3$.

(a)



(b)



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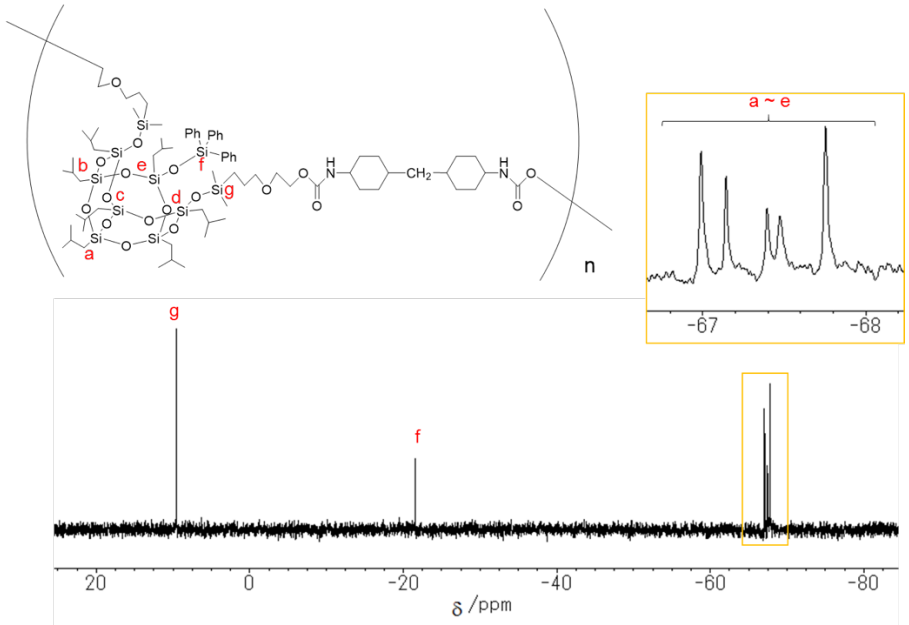
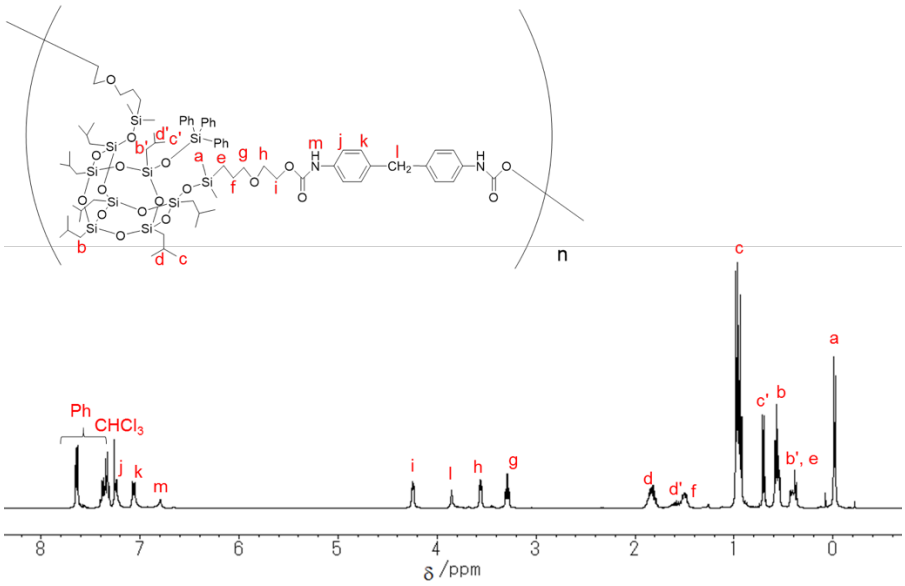
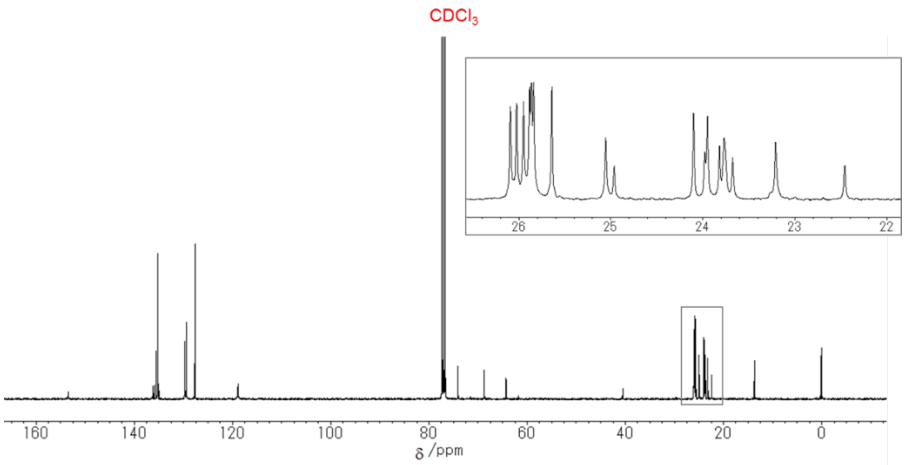


Figure S7 (a) ^{1}H-, (b) ^{13}C-, and (c) ^{29}Si-NMR spectra of **4c** in $CDCl_3$.

(a)



(b)



(c)

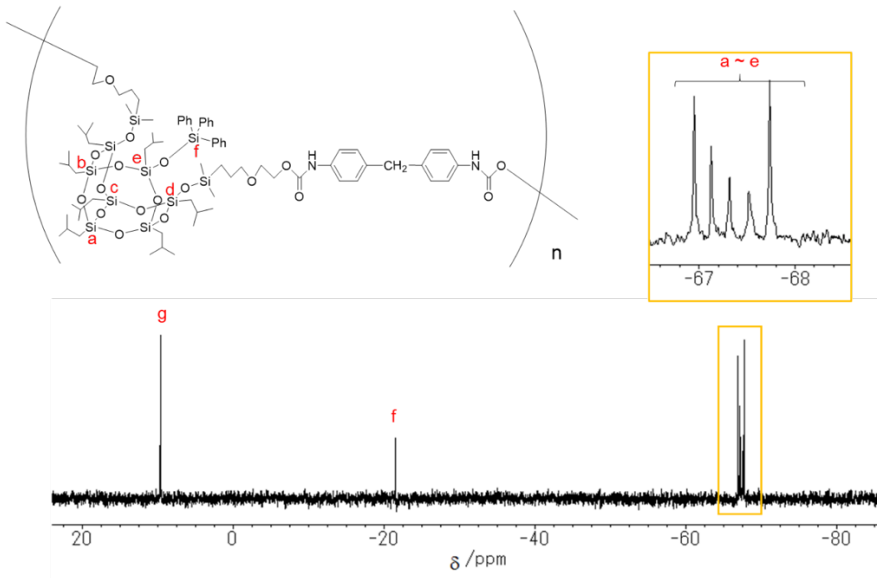


Figure S8 (a) ^{1}H-, (b) ^{13}C-, and (c) ^{29}Si-NMR spectra of **4d** in $CDCl_3$.

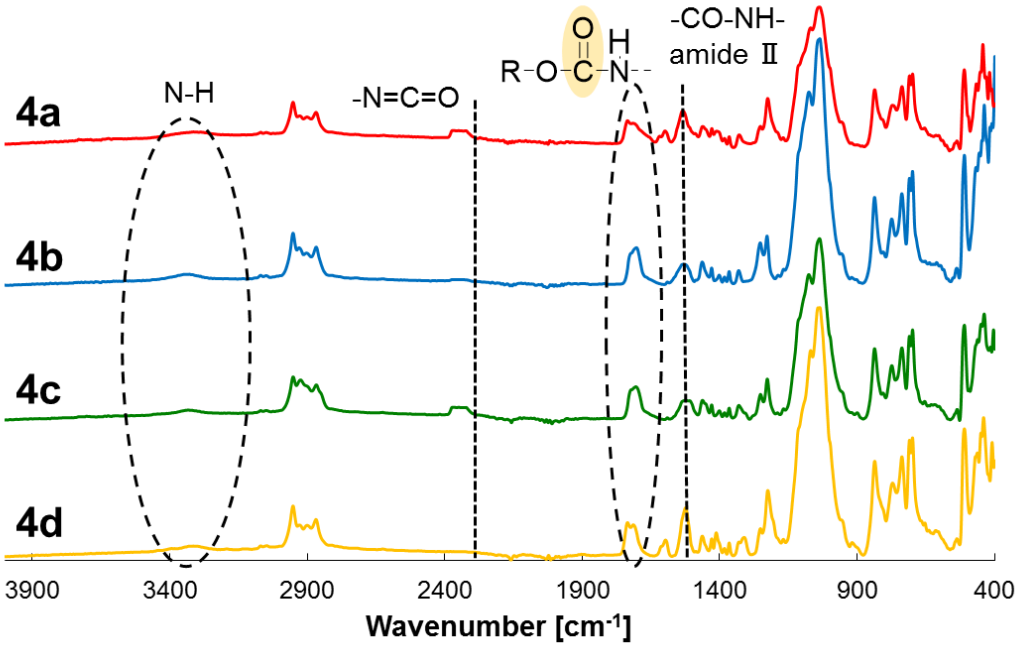


Figure S9 FT-IR spectra of **4a**, **4b**, **4c**, and **4d**.

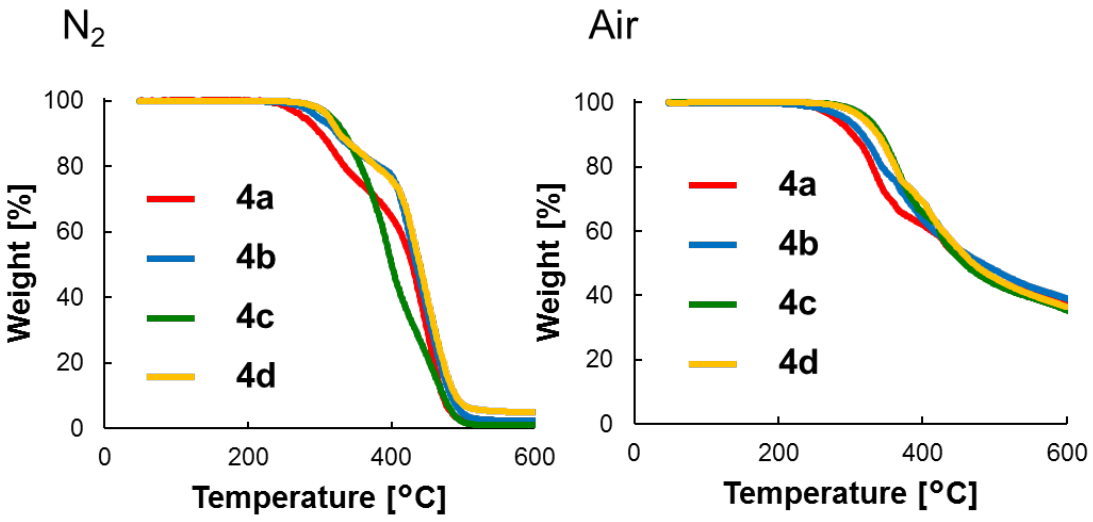


Figure S10 TGA thermograms of the polymers under N_2 and air, 10 °C/min. No residue remained under N_2 due to sublimation, but high residual weights corresponding to SiO_2 were remained under air.

Table S1 Static water contact angles of the films of PMMA and PMMA containing **4**.

Polymer		Static water contact angles [˚]					
	100 wt%	0.5 wt%	1 wt%	2 wt%	5 wt%	10 wt%	20 wt%
4a	105.0 ± 1.0	101.5±1.0	101.8±1.6	102.9±1.7	102.0±1.3	102.1±1.3	102.8±1.1
4b	121.4 ± 2.4	105.3±1.2	106.2±0.8	106.2±1.8	110.4±1.2	110.9±1.0	113.8±2.1
4c	104.4 ± 1.7	101.3±0.8	101.6±1.2	102.7±1.2	101.6±0.7	101.9±1.6	102.4±1.5
4d	106.1 ± 0.7	102.0±0.3	101.8±1.2	103.2±1.3	102.9±0.5	101.3±1.1	102.5±0.7

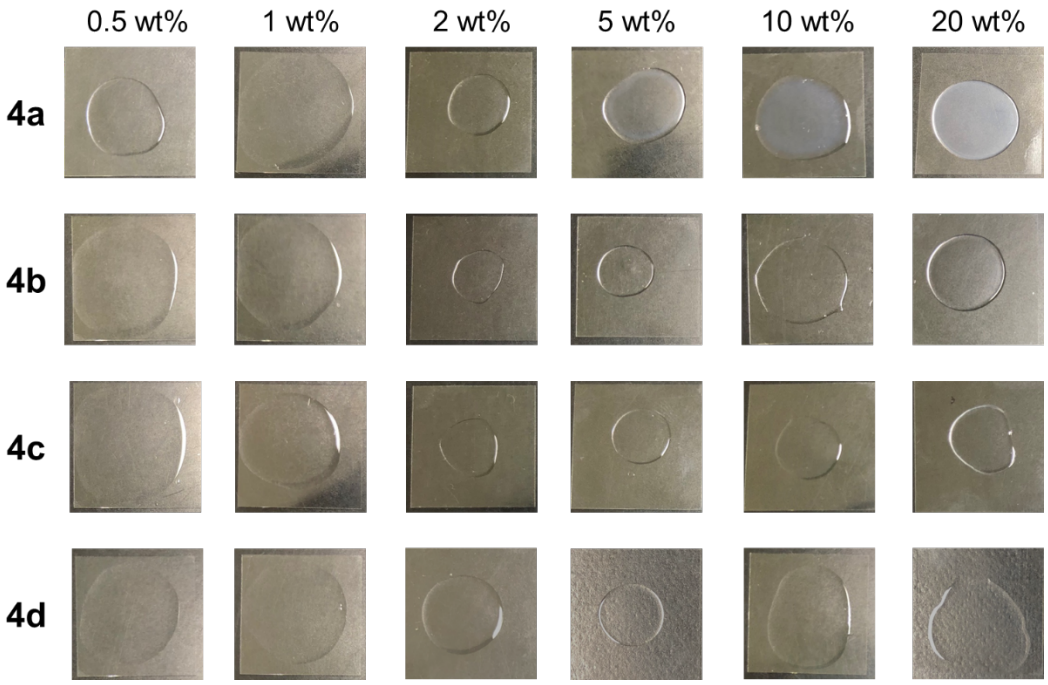


Figure S11 Photographs of PMMA films containing 0.5, 1, 2, 5, 10, and 20 wt% **4**.

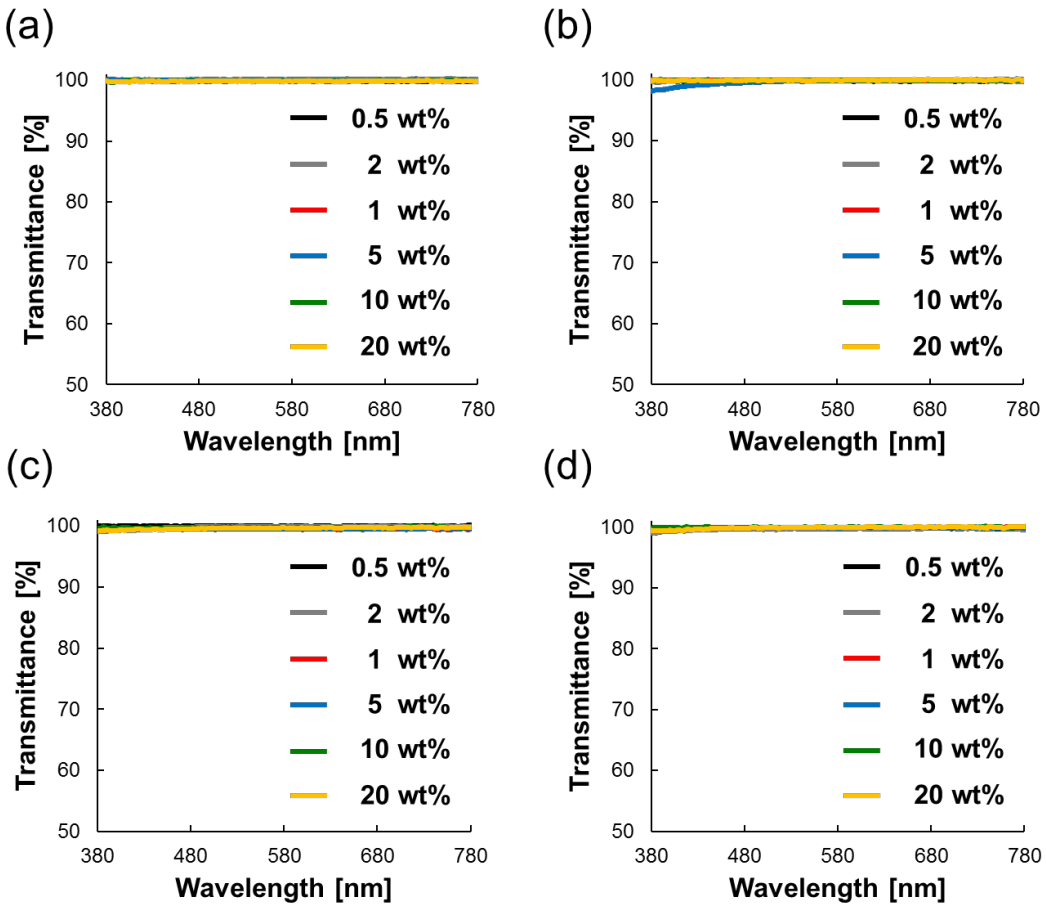


Figure S12 Transmittance spectra of PMMA films containing 0.5, 1, 5, 10, and 20 wt% of (a) **4a**, (b) **4b,** (c) **4c**, and (d) **4d**.

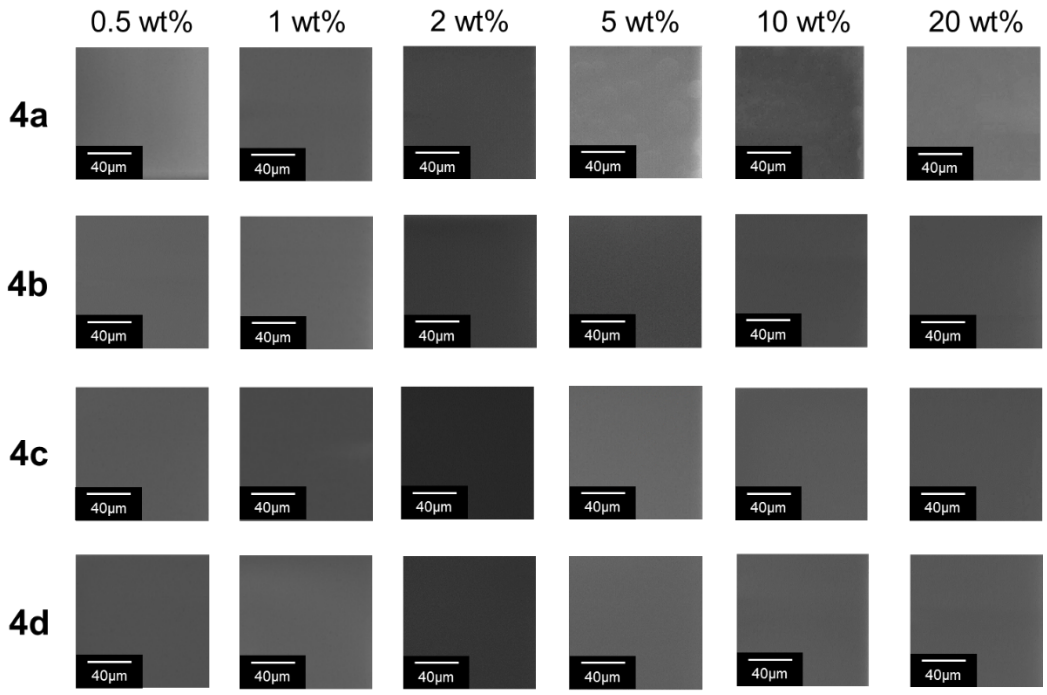


Figure S13 SEM images of PMMA films containing 0.5, 1, 2, 5, 10, and 20 wt% **4**.

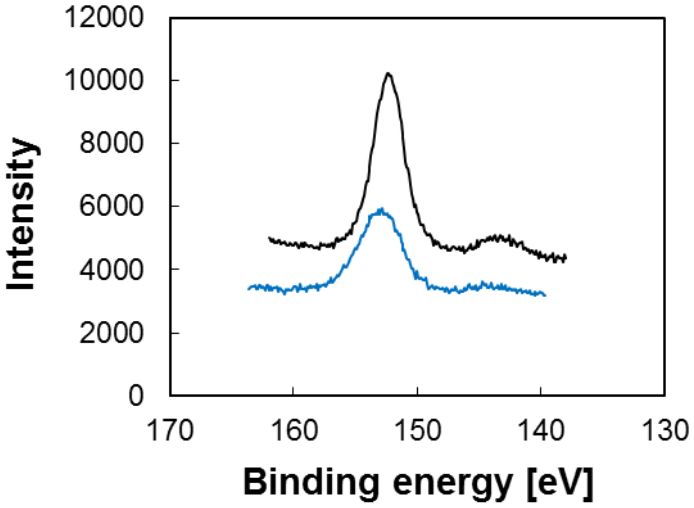


Figure S14 Si 2p spectra of the PMMA film containing 5 wt% **4a** before and after the argon ion sputtering.

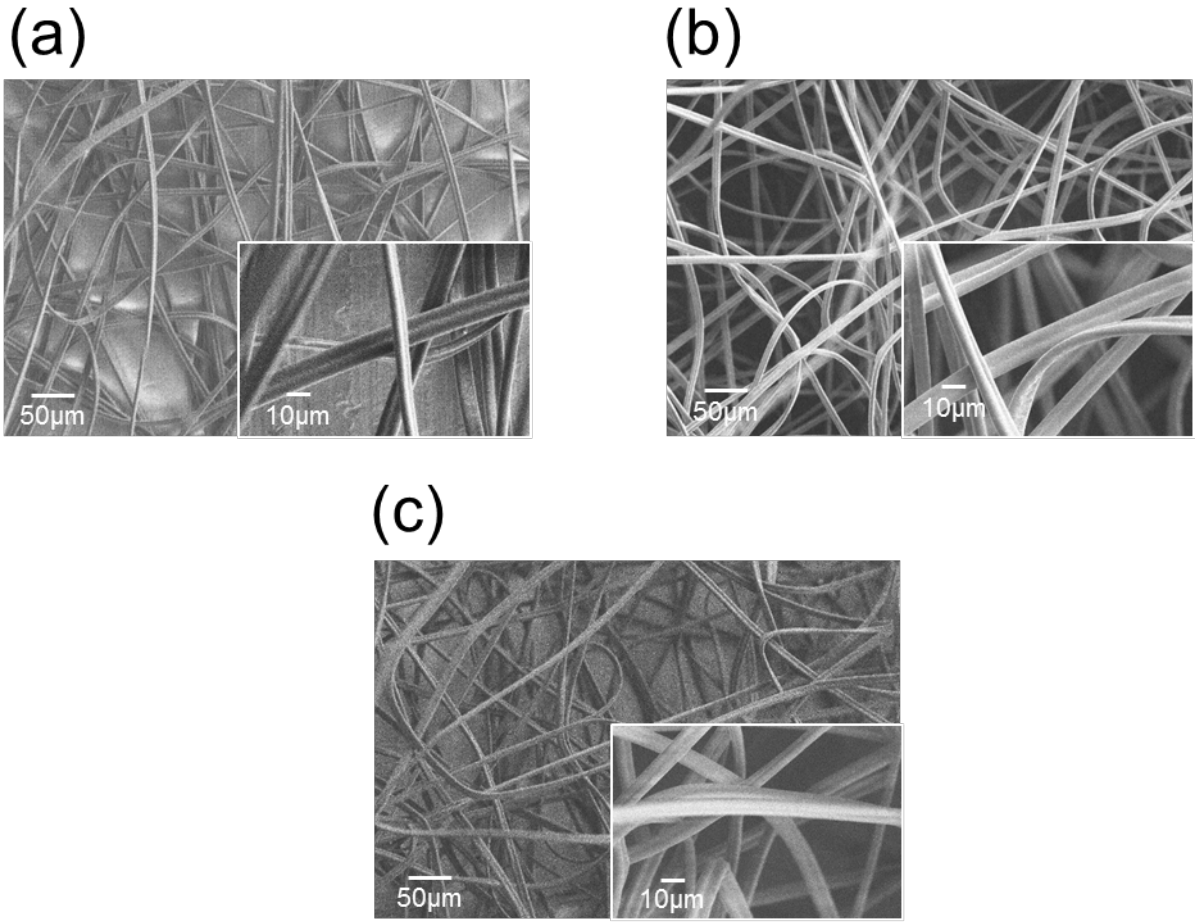


Figure S15 SEM images of (a)PMMA nanofiber, (b) PMMA with 2 wt% **4a**, and (c) PMMA with 5 wt% **4a**.