Supplementary Information

Chemical modification of poly(isosorbide carbonate)-based copolymers with boronic acids and the ammonolysis of the modified copolymers

Kazuaki Rikiyama[a], Akari Matsunami[a], Shunsuke Fujimata[a], Tatsuo Taniguchi[a], and Daisuke Aoki[a]*

[a] *Department of Applied Chemistry and Biotechnology, Graduate School of Engineering, Chiba University, 1-33 Yayoi-cho, Inage-ku, Chiba-shi, Chiba 263-8522, Japan.*

Corresponding Authors
* D. Aoki. Email: daoki@chiba-u.jp

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1. Enlarged ^{1}H NMR spectra of P(IC-*co*-DBMC) and P(IC-*co*-MC)

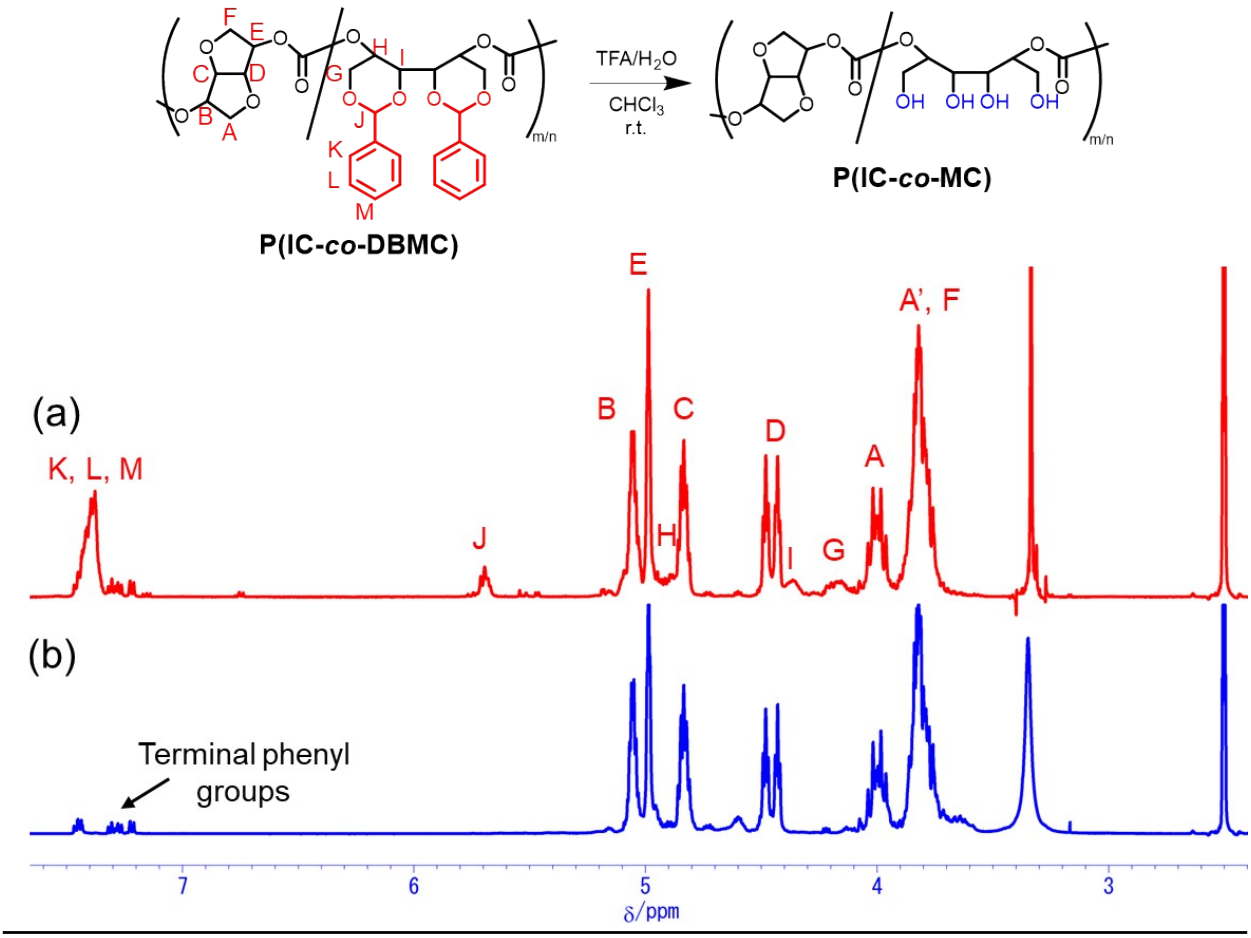


Figure S1. Enlarged ^{1}H NMR spectra of (a) phenylboronic acid, (a) **P(IC-*co*-DBMC)** and (b) **P(IC-*co*-MC)** (500 MHz, 25 °C, DMSO-d_6).

2. DOSY spectrum of P(IC-*co*-MC)PB

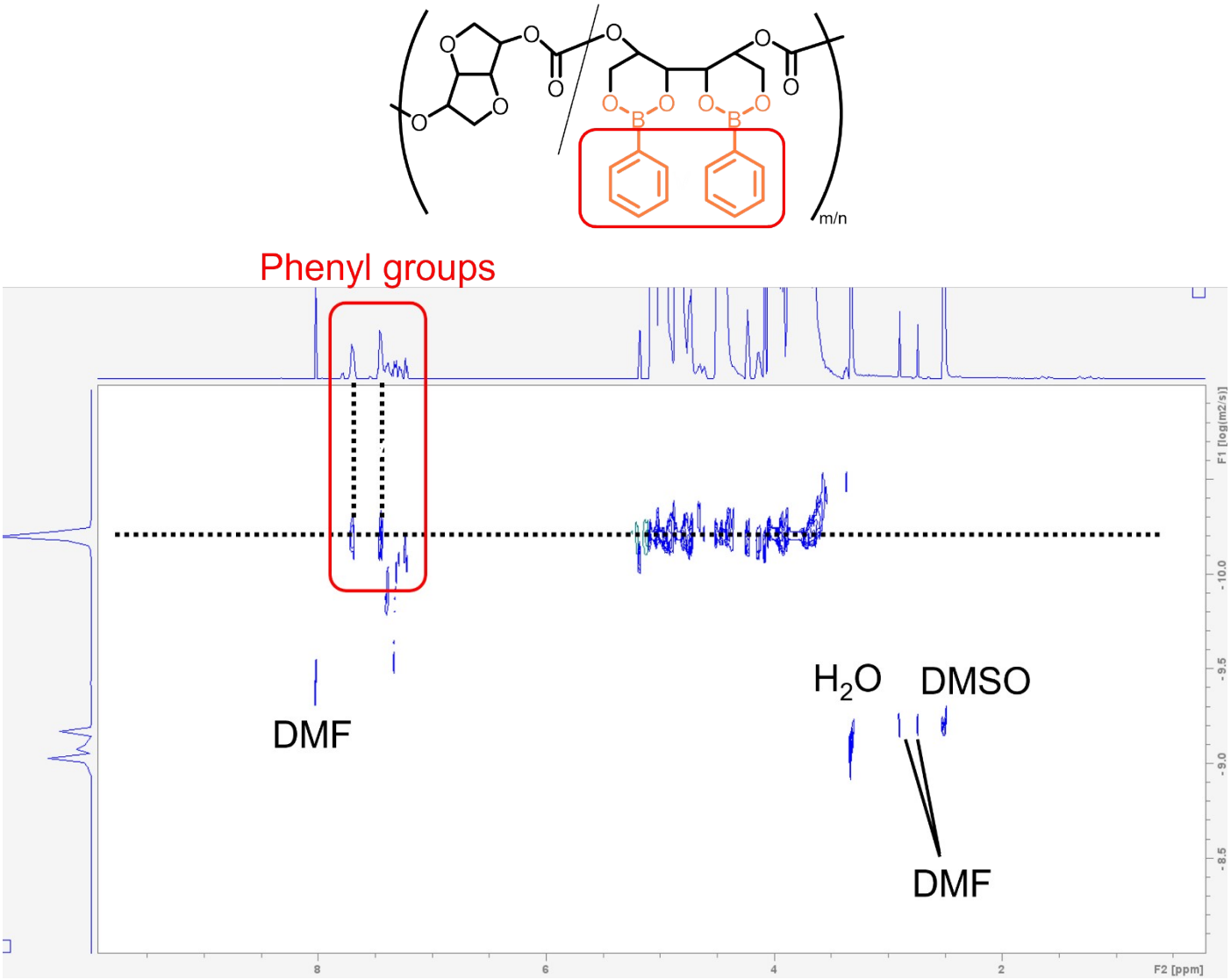


Figure S2. DOSY spectrum of **P(IC-*co*-MC)PB** (500 MHz, 25 °C, DMSO-d_6).

3. Synthesis and deprotection of P(nBA-*co*-PB)

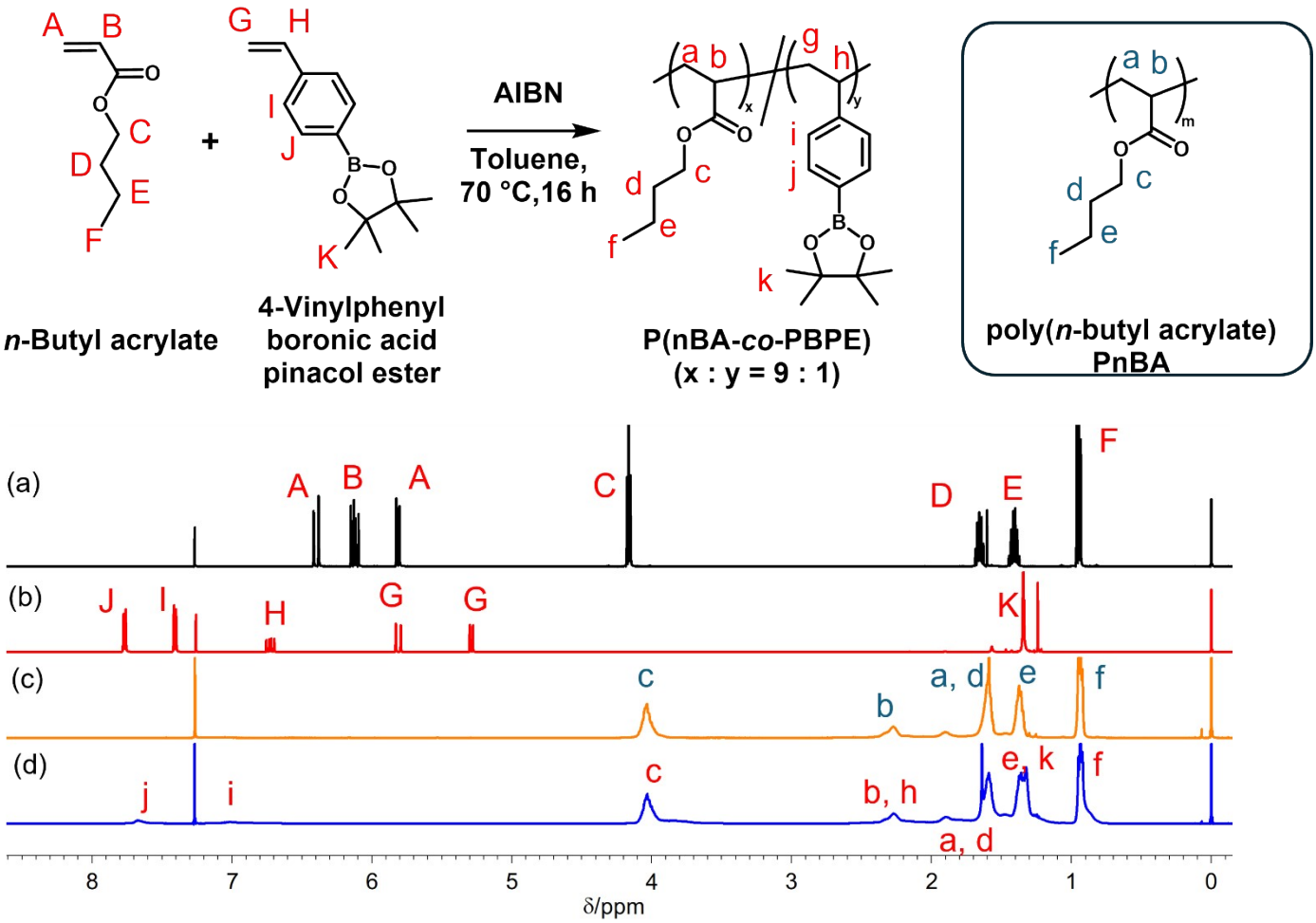


Figure S3. ^{1}H NMR spectrum of (a)*n*-butyl acrylate, (b) 4-vinylphenylboronic acid pinacol ester, (c) poly(*n*-butyl acrylate) (**PnBA**), and (d) **P(nBA-*co*-PBPE)** (500 MHz, 25 °C, DMSO-d_6).

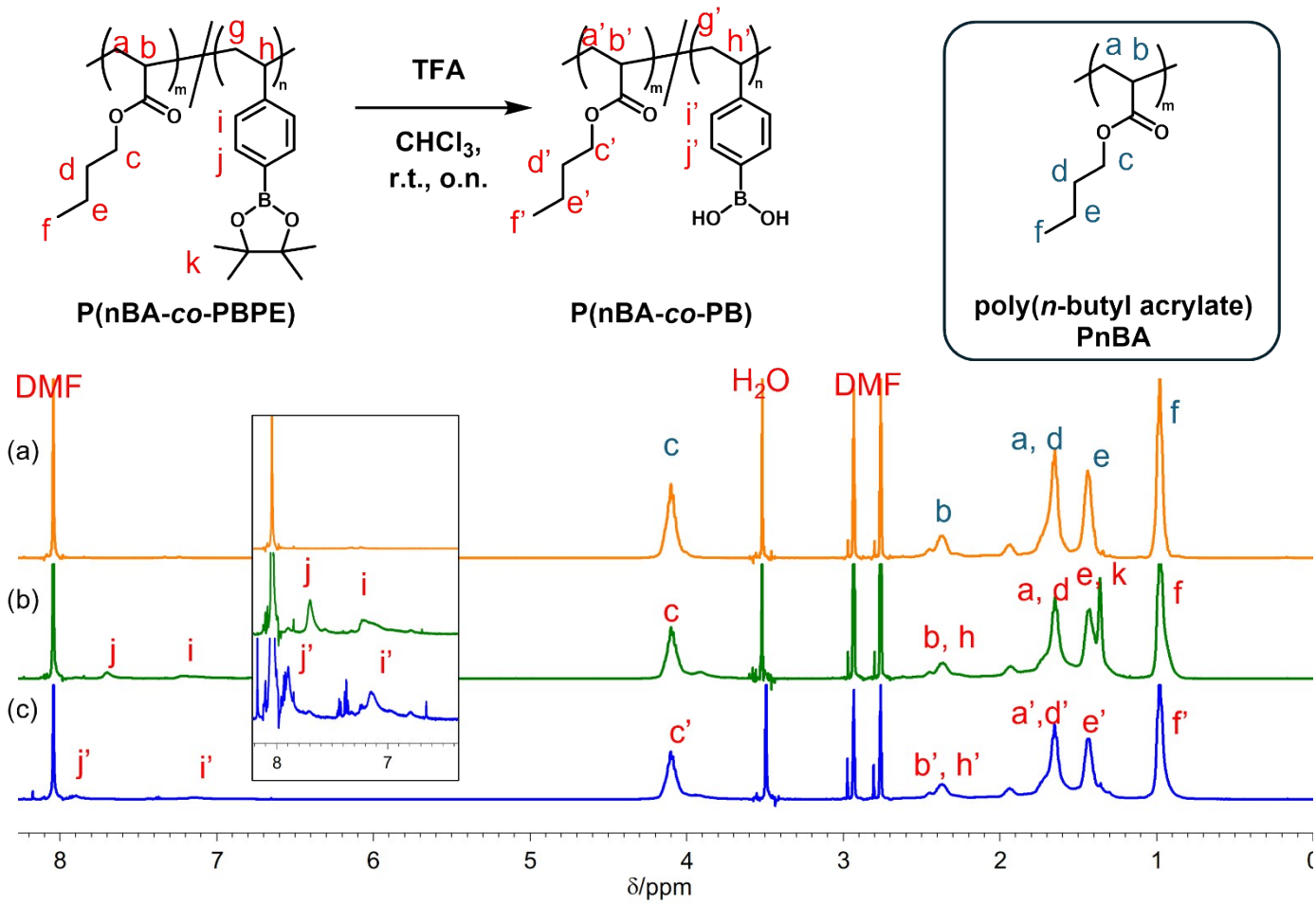


Figure S4. ^{1}H NMR spectrum of (a) **PnBA**, (b) **P(nBA-*co*-PBPE)**, and (c) **P(nBA-*co*-PB)** (500 MHz, 25 °C, DMF-d_7).

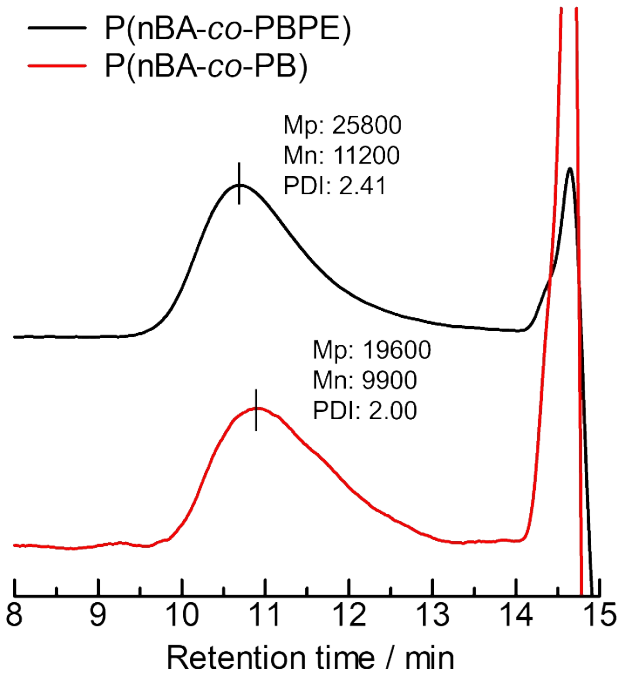


Figure S5. GPC profiles of **P(nBA-*co*-PBPE)**, and **P(nBA-*co*-PB)** (eluent: DMF, detector: RI, standard: polystyrene).

4. Photo of processed polymers

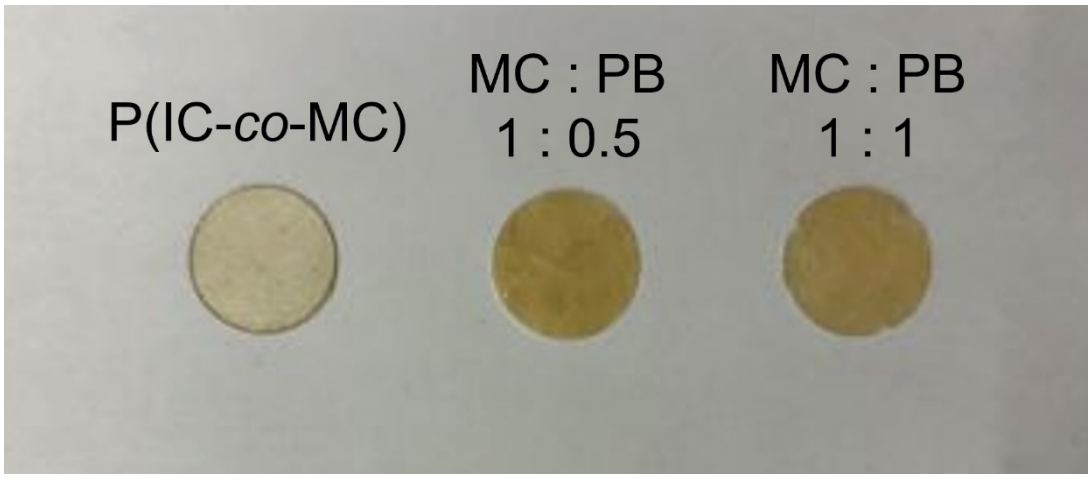


Figure S6. Photo of sample disks processed by hot-press method with MeltPrep VCM.

5. Thermal property of P(nBA-*co*-PB)

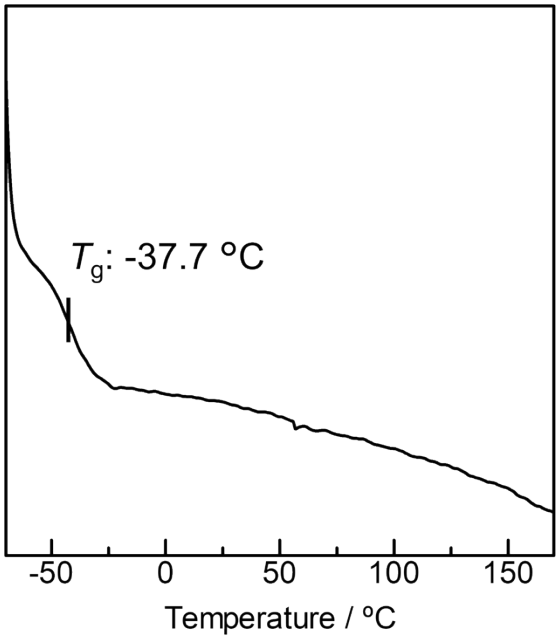


Figure S7. DSC curve of **P(nBA-co-PB)** carried out on a SHIMADZU DSC-60A Plus with a heating rate of 10 °C min^{-1} under a flow of N_2.

6. Frequency dependence of G' and G''

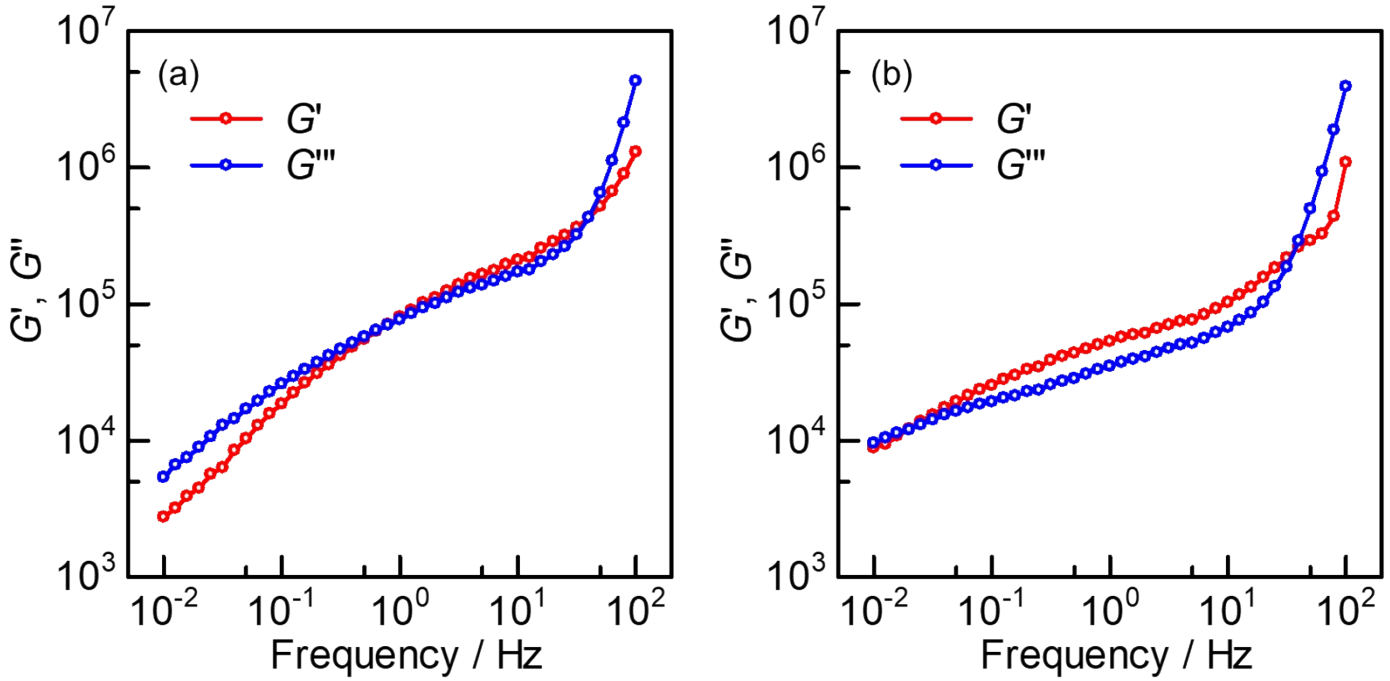


Figure S8. Frequency dependence of the polymer mixture at 140 °C. (a) MC:PB = 1: 0.5, (b) MC:PB = 1 : 1.

7. Ammonolysis of P(IC-*co*-MC) and P(IC-*co*-MC)PB at 30 °C

$[M_p]_t / [M_p]_0$ = $[M_p]_t$: The peak top molecular weight at time "t".
$[M_p]_0$: The peak top molecular weight before the degradation reaction

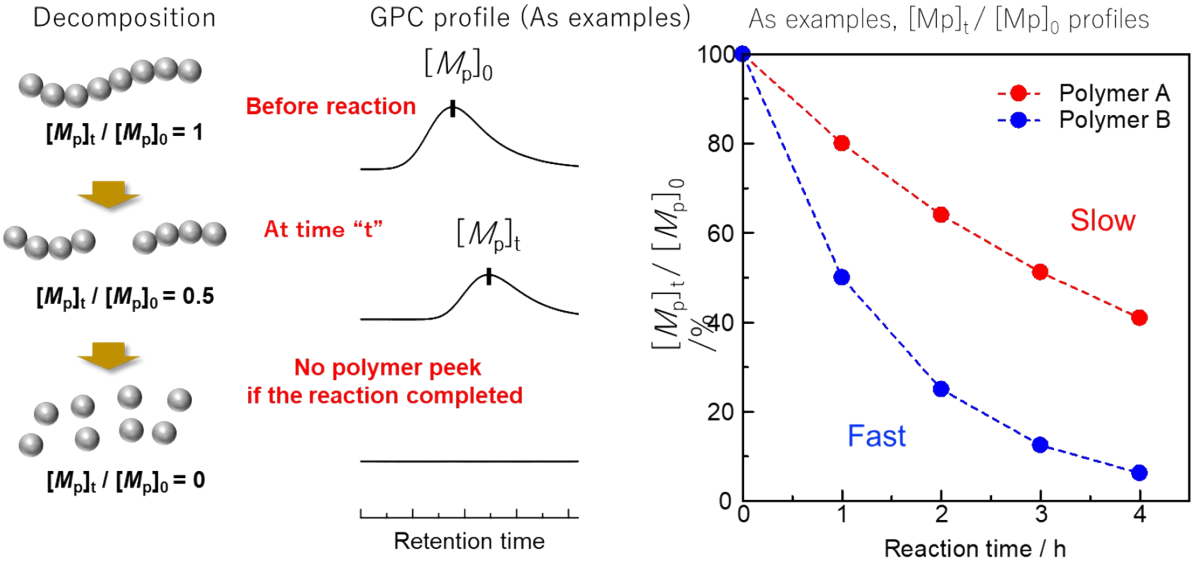


Figure S9. Plots of $[M_p]_t/[M_p]_0$ as an example.

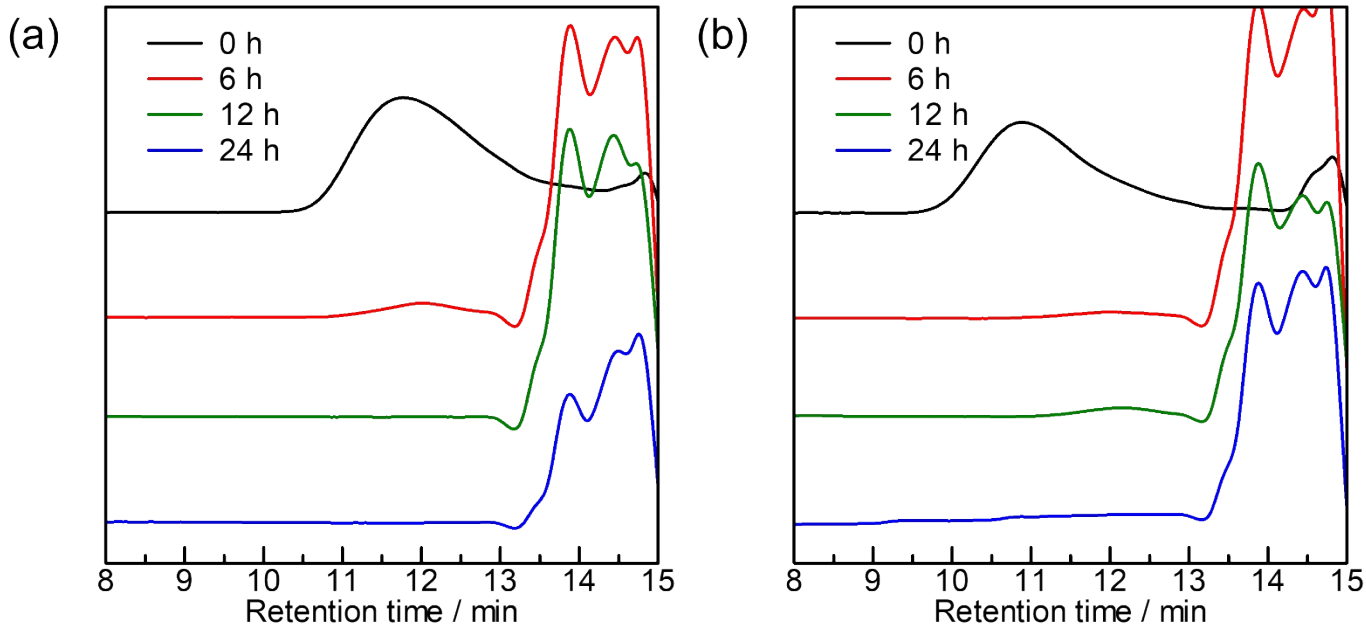


Figure S10. GPC profiles of the decomposition products of (a) **P(IC-*co*-MC)**, and (b) **P(IC-*co*-MC)PB** during the ammonolysis at 30 °C (eluent: DMF, detector: RI, standard: polystyrene)

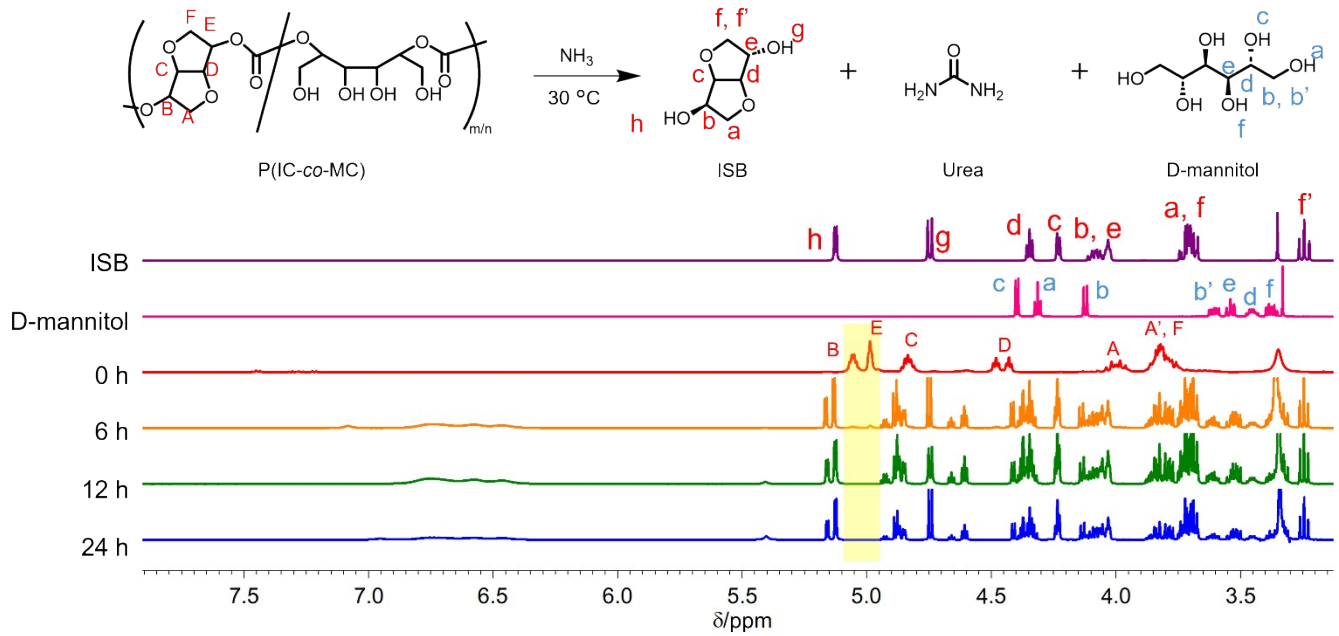


Figure S11. ^{1}H NMR spectra of **P(IC-*co*-MC)** before reaction 0 h (red) and after reaction at 6 h (orange), 12 h (green), and 24 h (blue) during the ammonolysis at 30 °C. The yellow highlighted peaks were derived from the polymer.

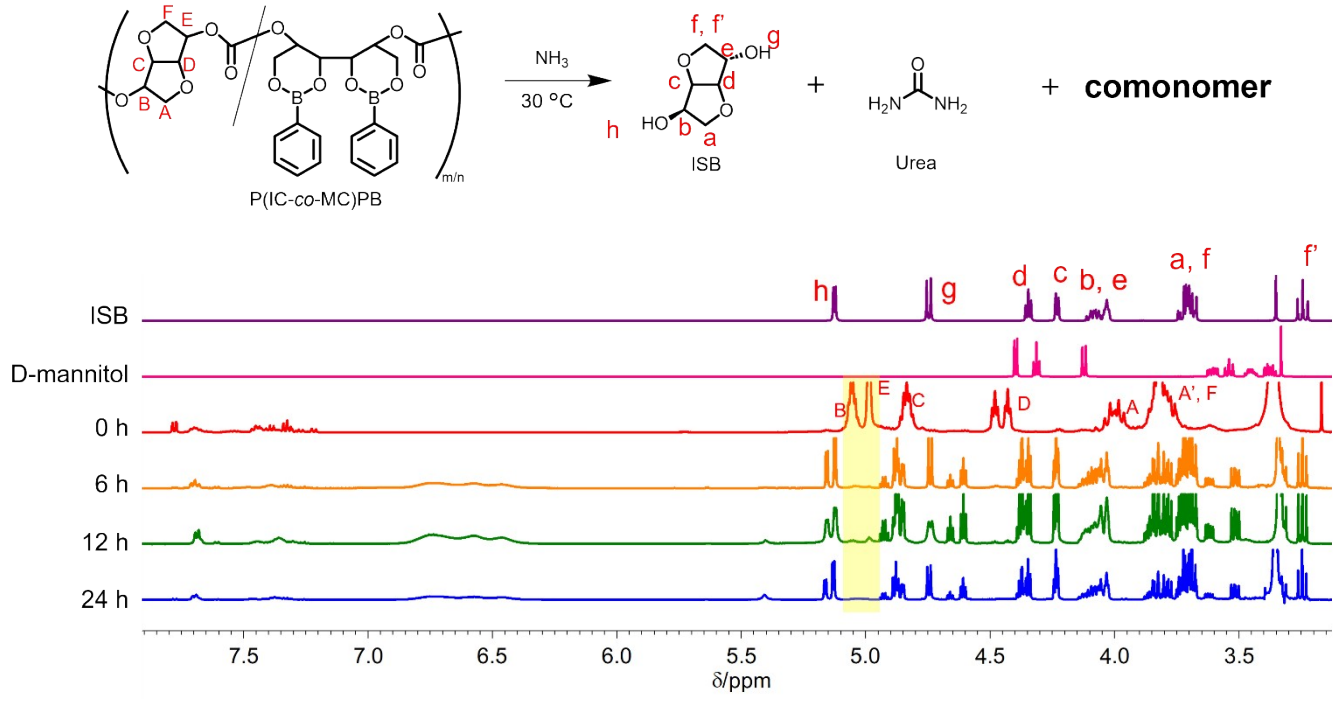
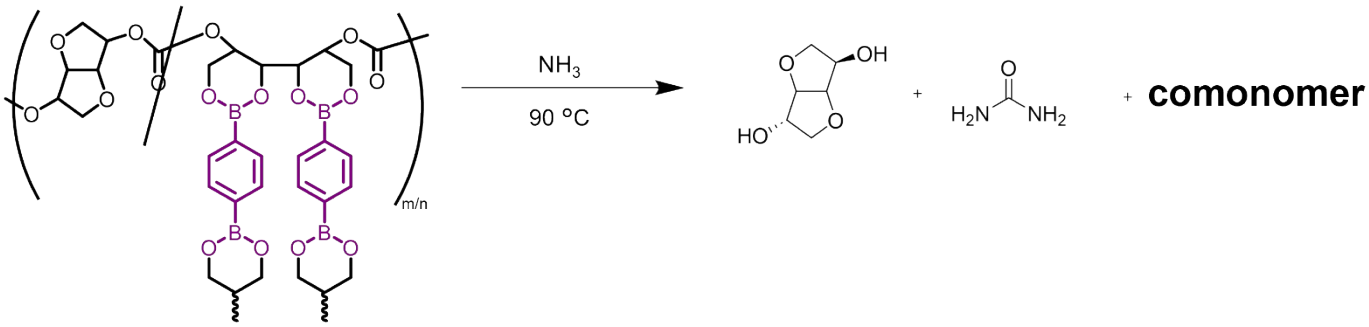


Figure S12. ^{1}H NMR spectra of **P(IC-*co*-MC)PB** before reaction 0 h (red) and after reaction at 6 h (orange), 12 h (green), and 24 h (blue) during the ammonolysis at 30 °C. The yellow highlighted peaks were derived from the polymer.

8. DOSY spectrum of the decomposed P(IC-*co*-MC)PDB



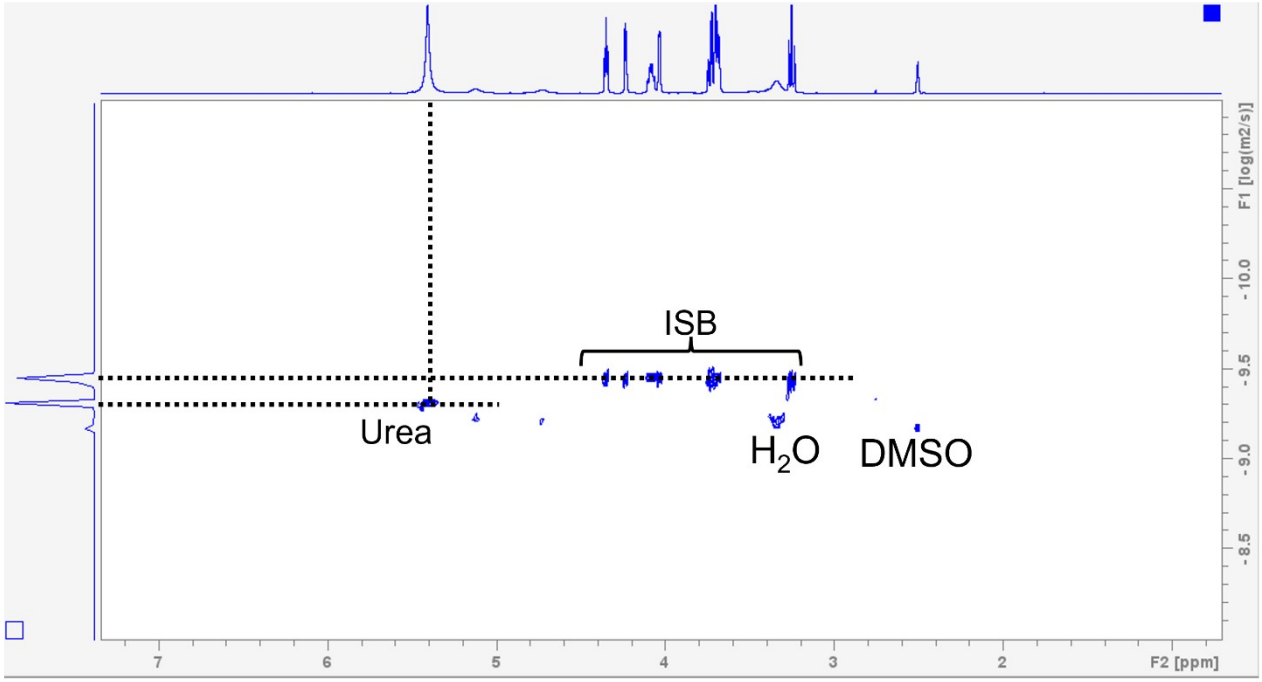


Figure S13. DOSY spectrum of the decomposition product of **P(IC-*co*-MC)PDB** after the ammonolysis at 90 °C (500 MHz, 25 °C, DMSO-d_6).

9. ^{1}H NMR spectrum of decomposition product of polymer mixture

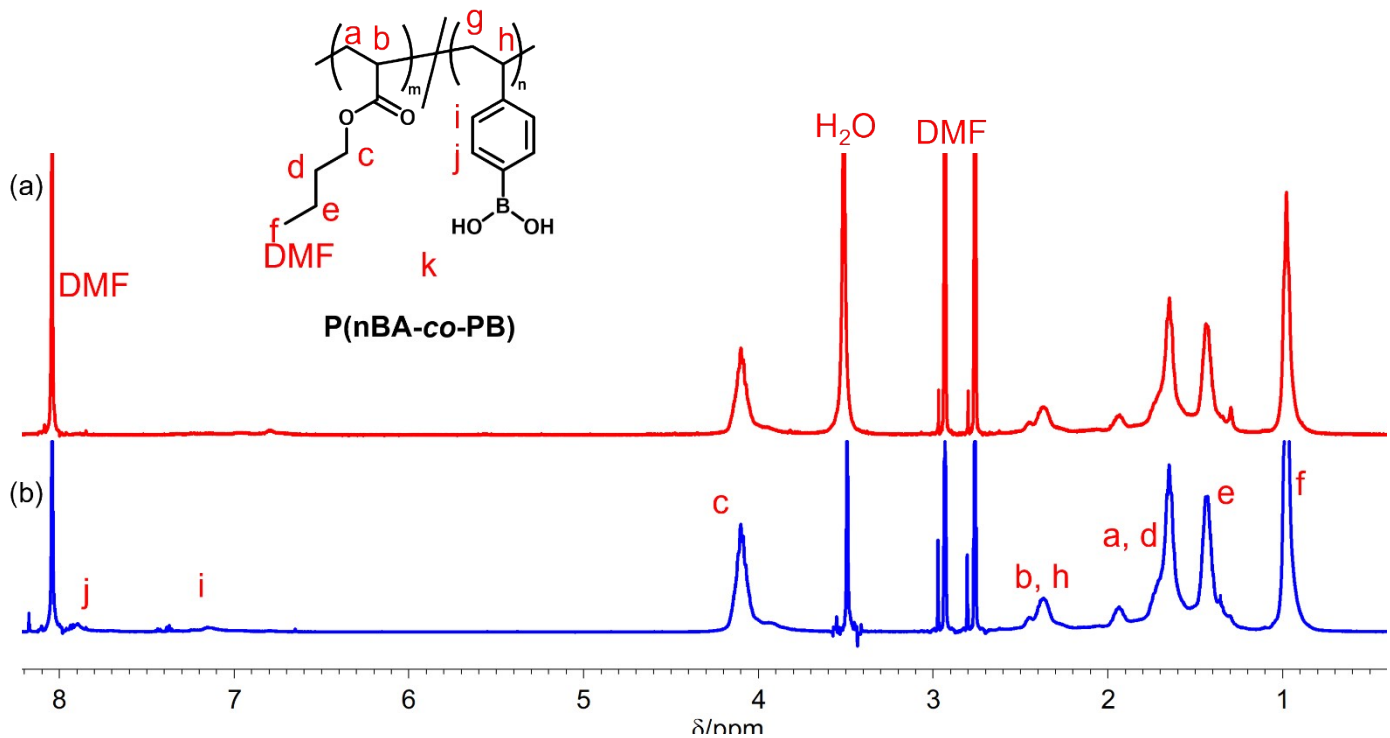


Figure S14. ^{1}H NMR spectra of (a) water insoluble part of the decomposition product and (b) original **P(nBA-*co*-PB)** (500 MHz, 25 °C, DMF-d_7)