Supporting Information

Maltopentaose-Conjugated CTA for RAFT Polymerization Generating Nanostructured Bioresource-Block Copolymer

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Experimental Section

Instrument

The purity of Mal_5-N_3 was determined by a size exclusion chromatography (SEC, pump: Jasco PU-2080 Plus, degasser: Jasco DG-2080-53, column oven: Jasco CO-2060 Plus, temperature of the column oven: 40 °C) in an aqueous solution containing 0.05 M $NaNO_3$. This SEC was equipped with the columns [Tosoh TSK-GEL G2500 PW_{XL} (size: 7.8 mm × 300 mm, average bead size: 7 μm, exclusion limit: 5.0 kg mol^{-1}), Tosoh TSK-GEL G4000 PW_{XL} (size: 7.8 mm × 300 mm, average bead size: 10 μm, exclusion limit: 1.0×10^3 kg mol^{-1}), and Tosoh TSK-GEL G6000 PW_{XL} (size: 7.8 mm × 300 mm, average bead size: 13 μm, exclusion limit: 5.0×10^4 kg mol^{-1})], and a refractive index detector (RI: Jasco RI-2031 Plus).

Results and Discussion

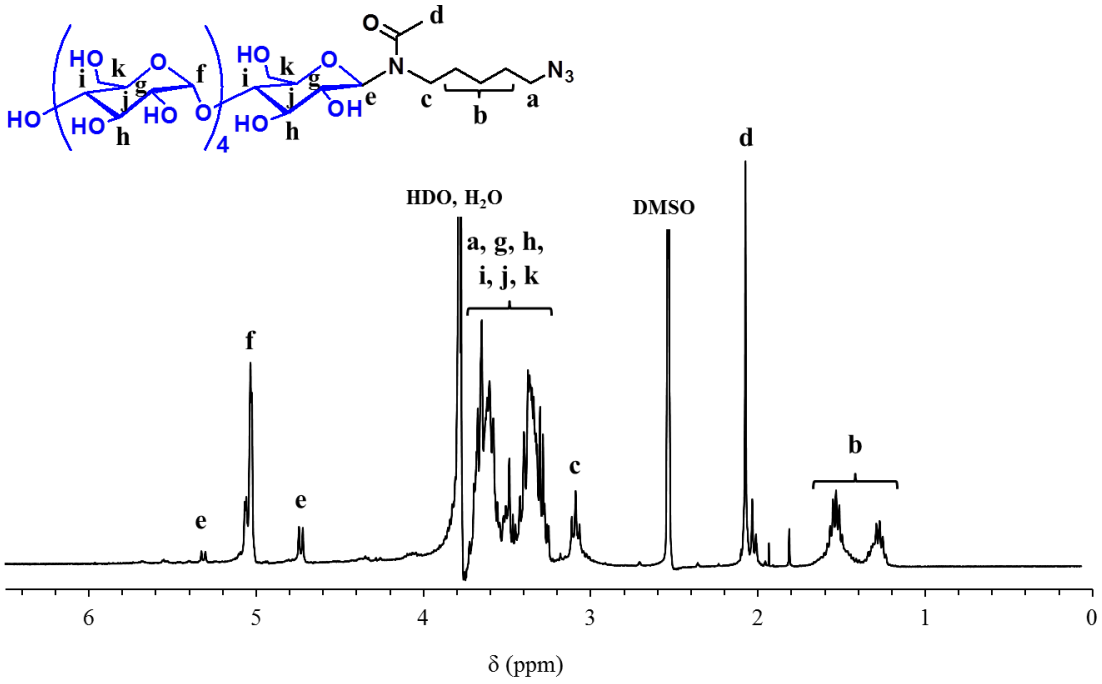

Figure SI-1. ^{1}H NMR spectrum of Mal_5-N_3 in DMSO-d_6/D_2O.

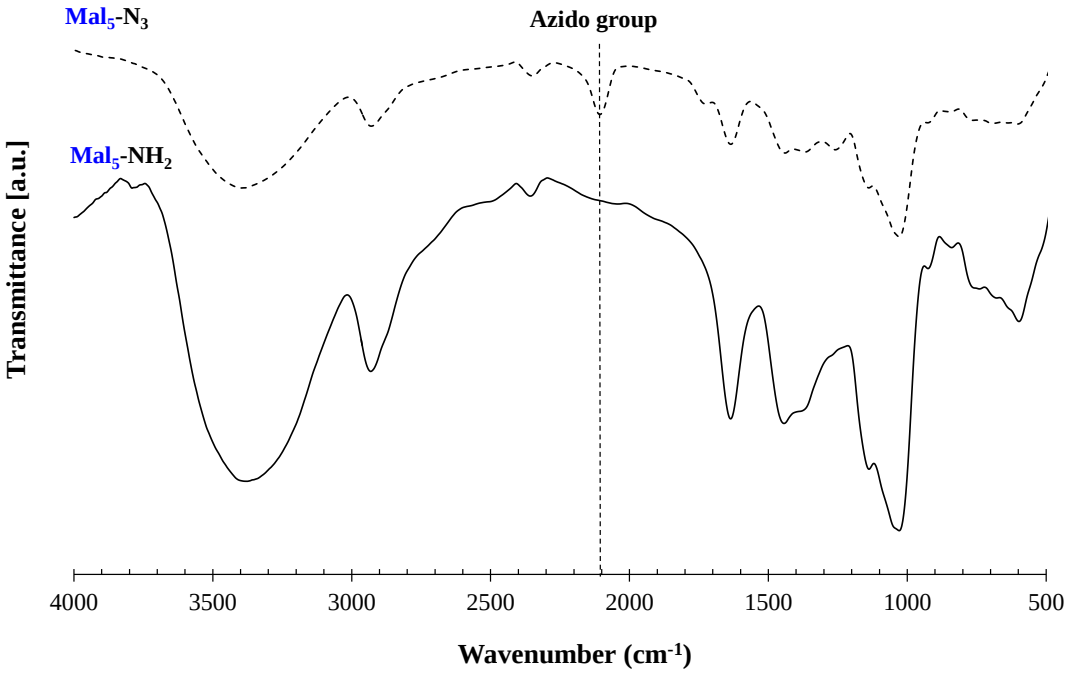

Figure SI-2. IR spectra of Mal_5-N_3 (dashed line) and Mal_5-NH_2 (solid line).

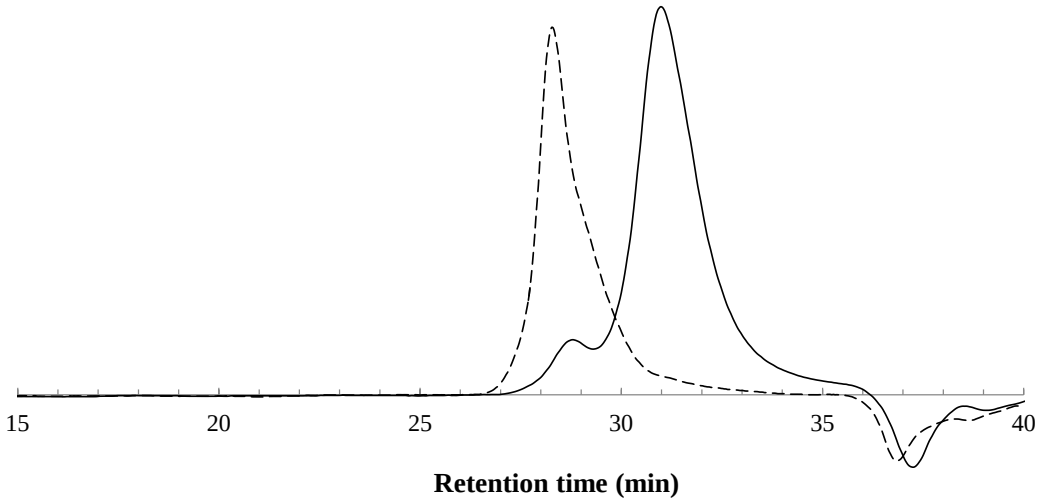

Figure SI-3. SEC traces of Mal_5-N_3 (solid line) and Mal_5 (dashed line) in 0.05 M $NaNO_3$ aqueous solution.

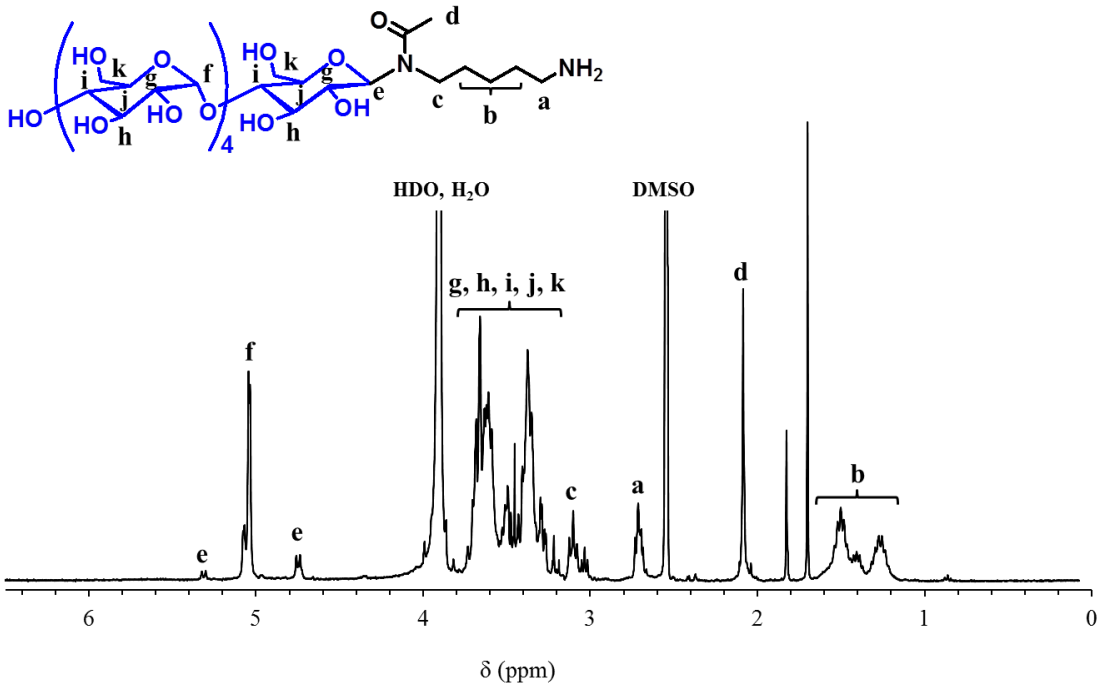

Figure SI-4. ^{1}H NMR spectrum of Mal_5-NH_2 in DMSO-d_6/D_2O.

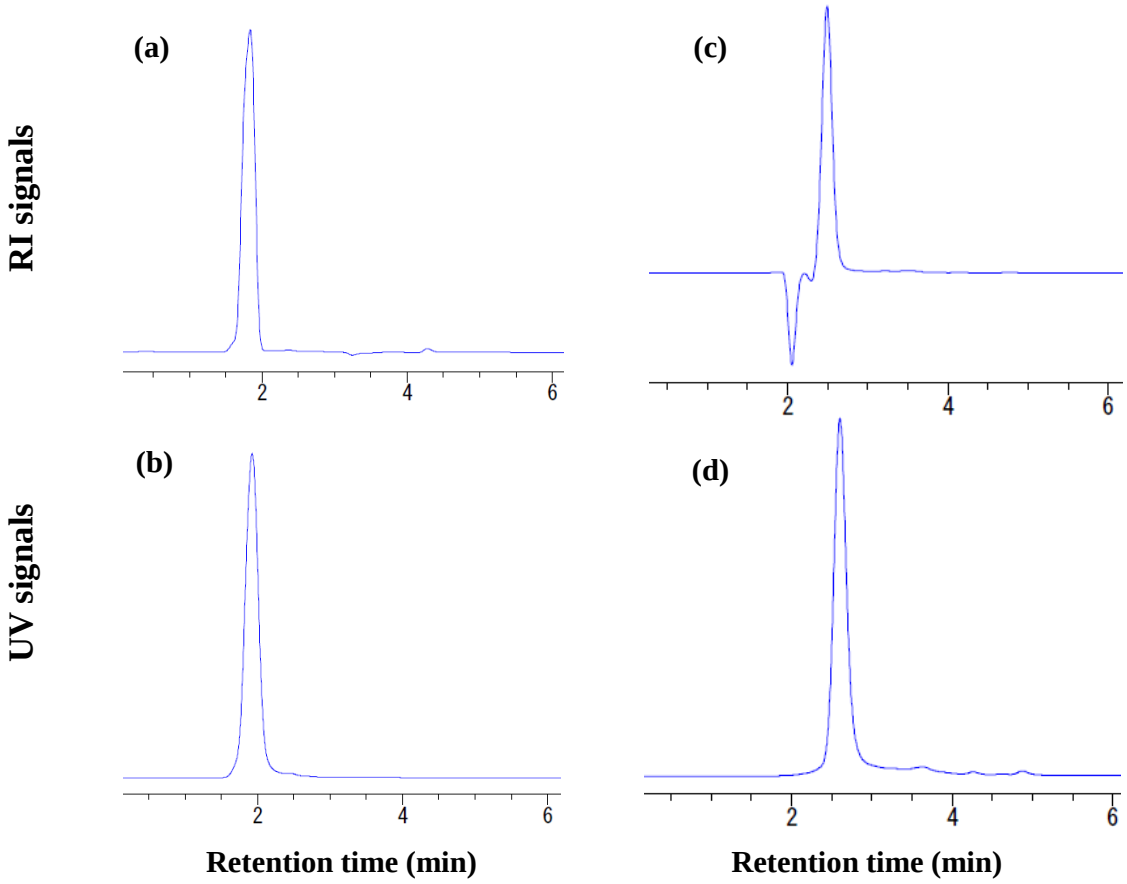

Figure SI-5. HPLC traces of (a and b) **1a** in CH_3CN/H_2O = 2/3 and (c and d) **1b** in MeOH.

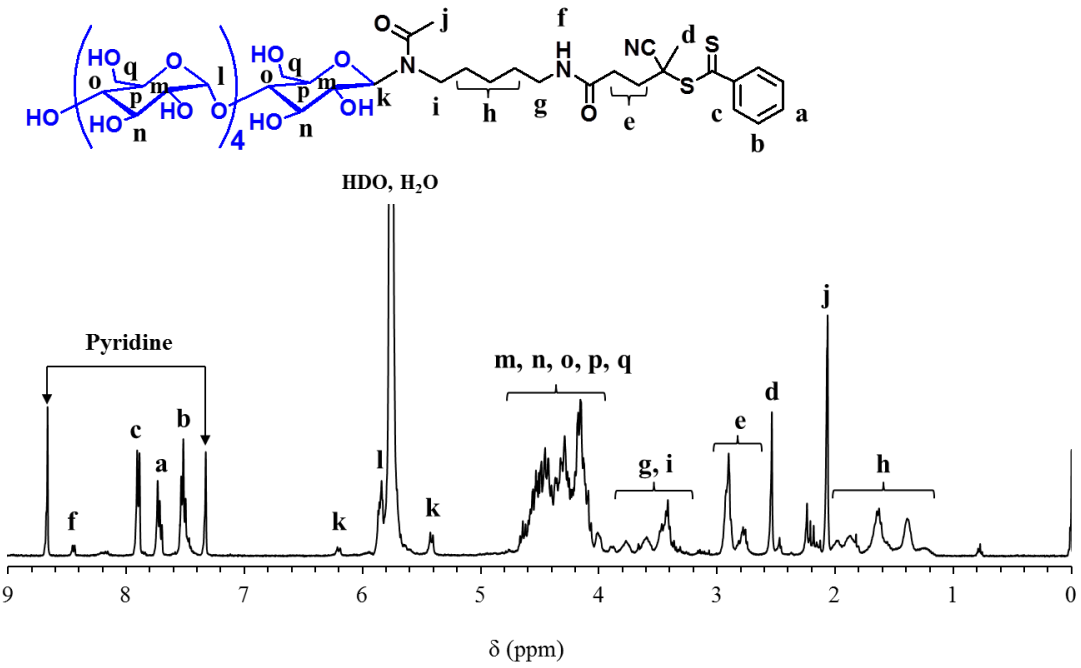

Figure SI-6. ^{1}H NMR spectrum of **1a** in pyridine-d_5/D_2O.

Table SI-1. Solubility of Mal_5-CTAs (1) [a]

Mal_5-CTAs	H_2O	CH_3OH	DMF	DMSO	Toluene	$CHCl_3$	1,4-dioxane	THF
1a	+	+	+	+	—	—	—	—
1b	+	+	+	+	—	—	—	+

[a] +, clear solution; —, suspension or precipitate.

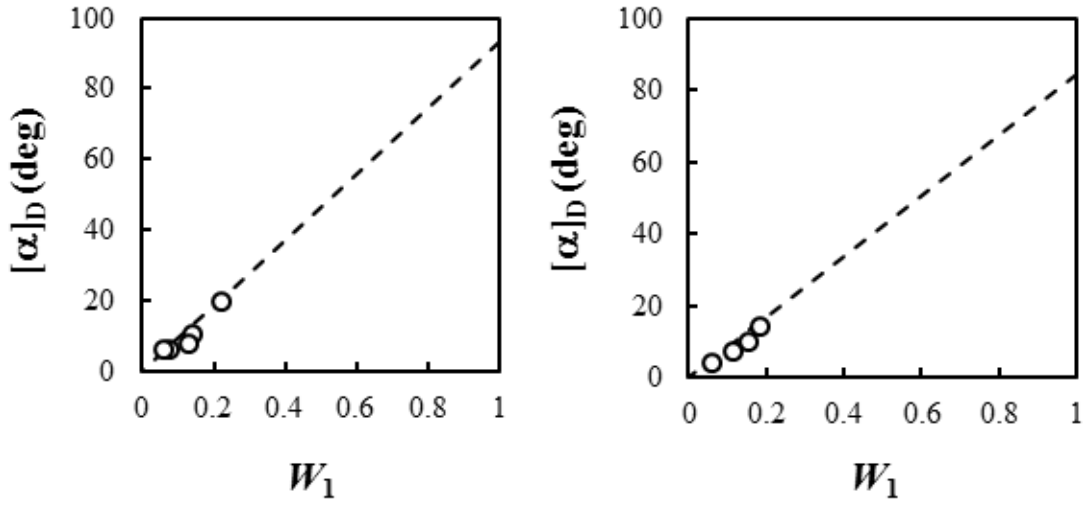

Figure SI-7. Plots of specific rotations for **2a** (left) and those for **2b** (right) as a function of their weight fractions of **1** (W_1s).

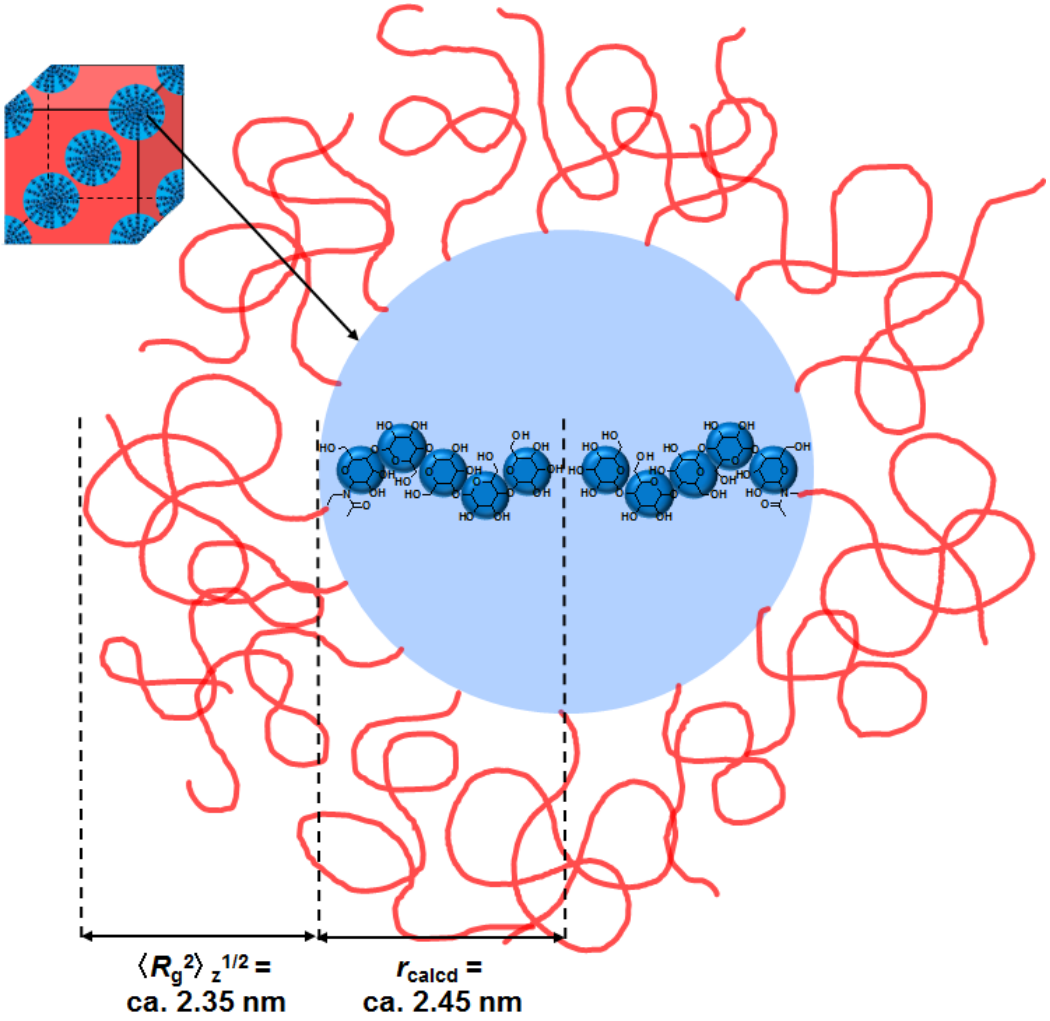

Figure SI-8. Supporting illustration representing r_{calcd} and z-averaged mean-square radius of gyration $\langle R_g^2 \rangle_z^{1/2}$ for the phase separated structures formed by **2b-I**. The r_{calcd} was calculated on the basis of the bound lengths; C-C bound: 0.154 nm, C-O bound: 0.145 nm. The $\langle R_g^2 \rangle_z^{1/2}$ was calculated by adopting the following equation.[1]

$$\langle R_g^2 \rangle_z^{1/2} = 1.12 \times 10^{-2} \, M_w^{0.60} \text{ (nm)}$$

Reference

(1) Konishi, T.; Yoshizaki, T.; Saito, T.; Einaga, Y.; Yamakawa, H. *Macromolecules* **1990**, *23*, 290-297.