Electronic Supplementary Material (ESI) for Journal of Materials Chemistry

Supporting Information for:

Preparation and Properties of Two-Leg Ladder Polymers Based on Polydiacetylenes

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1. General Procedure.

All chemicals were purchased from Kanto Chemical Co. Ltd. or Sigma Aldrich Co. Ltd. and used without further purification. Gel permeation chromatography (GPC) was performed on a JAI LC-918 equipped with JAIGEL -1H and -2H columns.

^{1}H and ^{13}C NMR spectra were recorded on a JEOL JNM-ECA-400 spectrometer in deuterated solvents (chloroform-*d* or acetone-d_6) with tetramethylsilane as an internal standard. ^{1}H NMR data are reported as follows: chemical shift in ppm downfield from tetramethylsilane (δ scale), multiplicity (s = singlet, d = doublet, t = triplet, dd = double doublet, tt = triple triplet and br. = broad), coupling constant (Hz) and integration. ^{13}C NMR chemical shifts are reported in ppm downfield from tetramethylsilane (δ scale). All ^{13}C NMR spectra were obtained with complete proton decoupling.

IR spectra were recorded on a JASCO FT/IR-420 spectrometer by using a KBr pellet. UV-Vis absorption spectrum was measured on a HITACHI U-2010 spectrometer. UV-Vis-NIR spectrum in solid state was measured on a SHIMADZU UV-3100PC spectrometer with an ISR-3100 integrating sphere attachment. Elemental analysis was recorded on a J-SCEINCE LAB MICRO CORDER JM10.

X-ray crystallographic data were obtained by a RIGAKU Saturn 724+ CCD device with a monochromatic Mo *K*α radiation. Powder X-ray diffraction (XRD) was recorded on a RIGAKU MiniFlex II diffractometer.

Polymerization of monomer **1** was performed in an electric oven. The powdered monomer was sealed into glass tubes with exchange gas of argon. The tubes were annealed at 100 °C for 400 hours. The conductivity of the doped polymer was measured by 2-probe method, where the polymer in a pellet sealed with excess amounts of iodine was placed in an electric oven.

2. Materials.

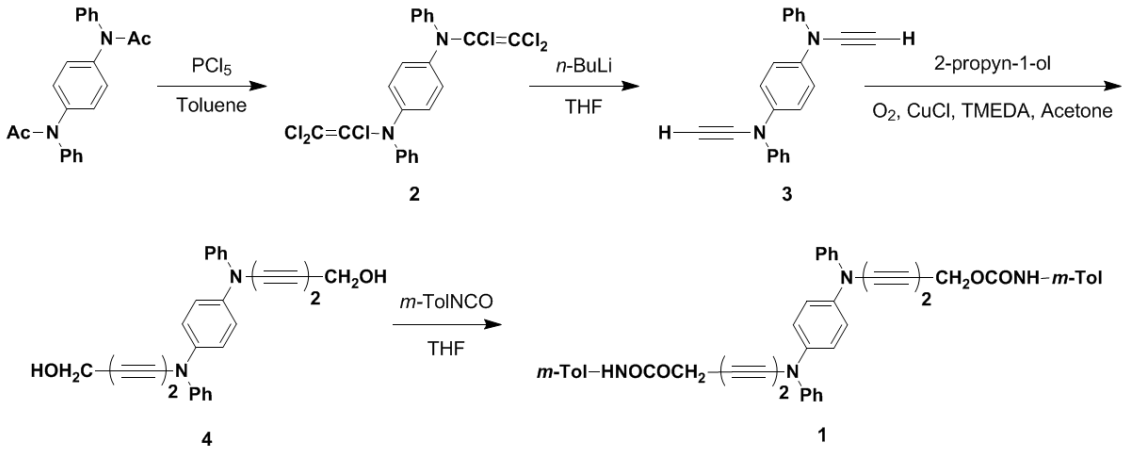


Figure S1. Preparation of monomer **1**.

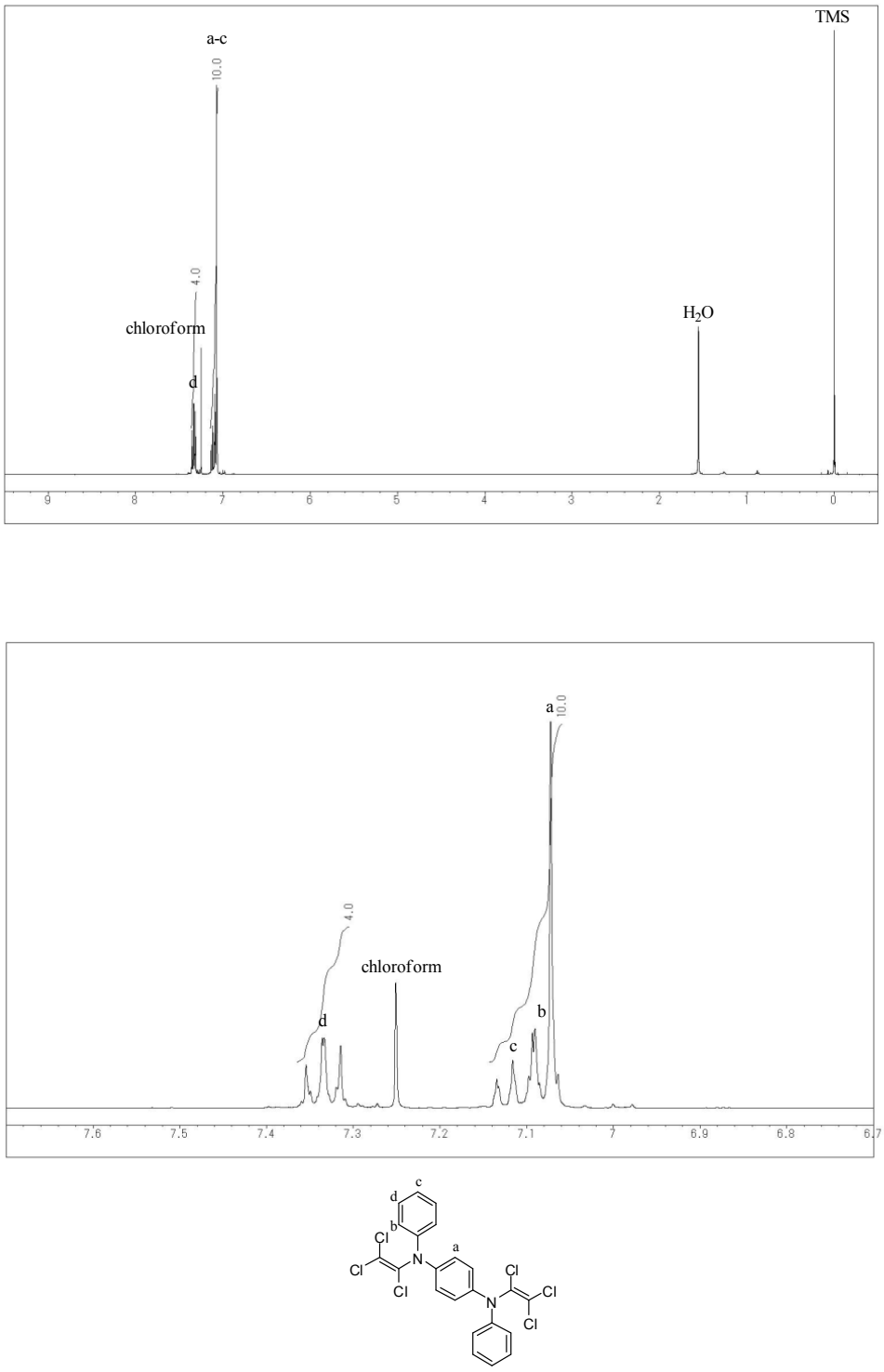
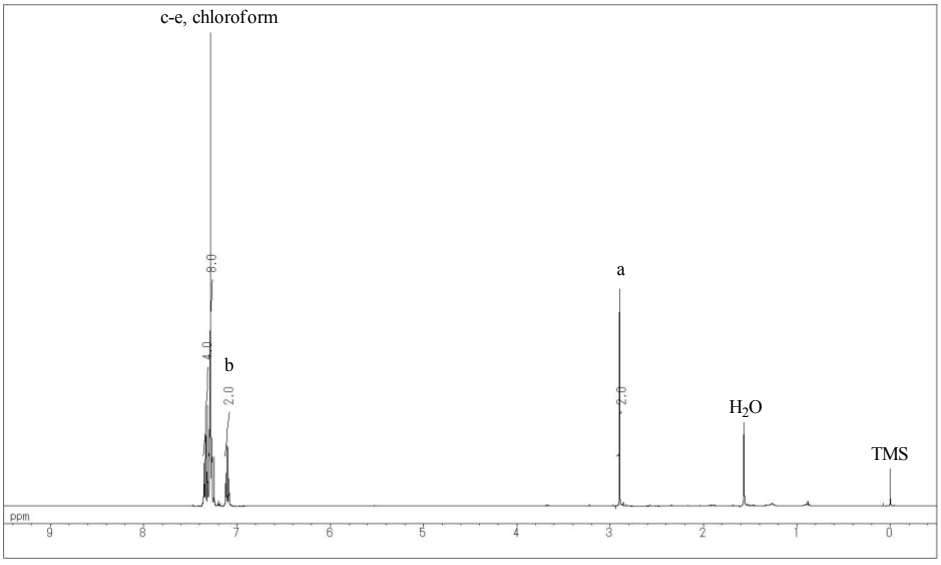
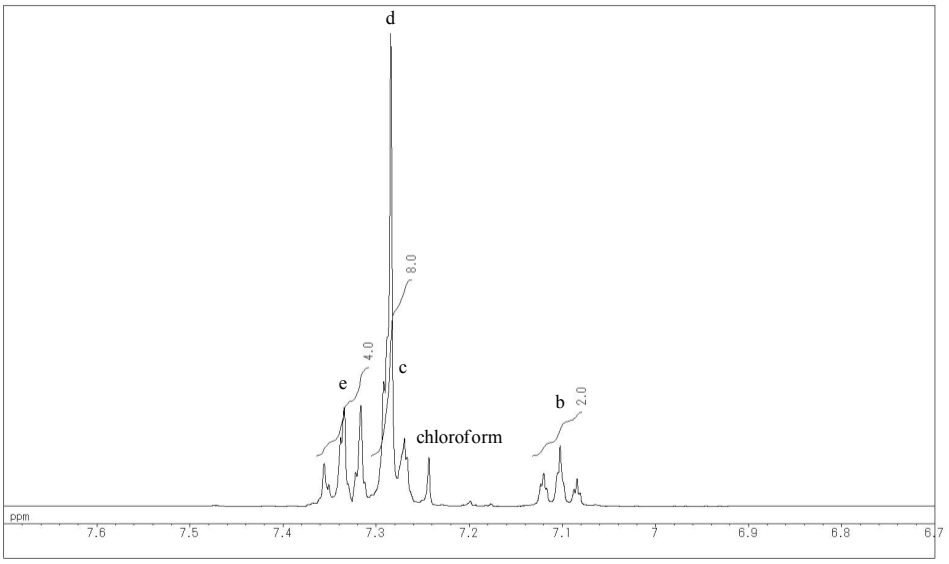


Figure S2. ^{1}H NMR spectra of **2**.





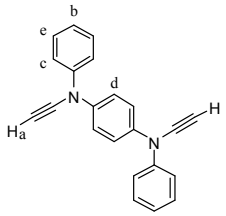


Figure S3. ^{1}H NMR spectra of **3**.

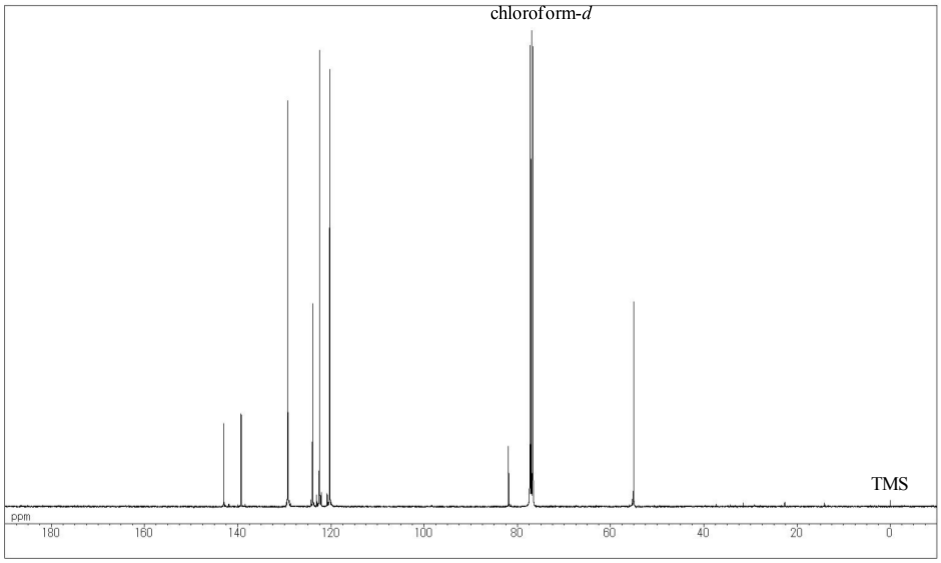
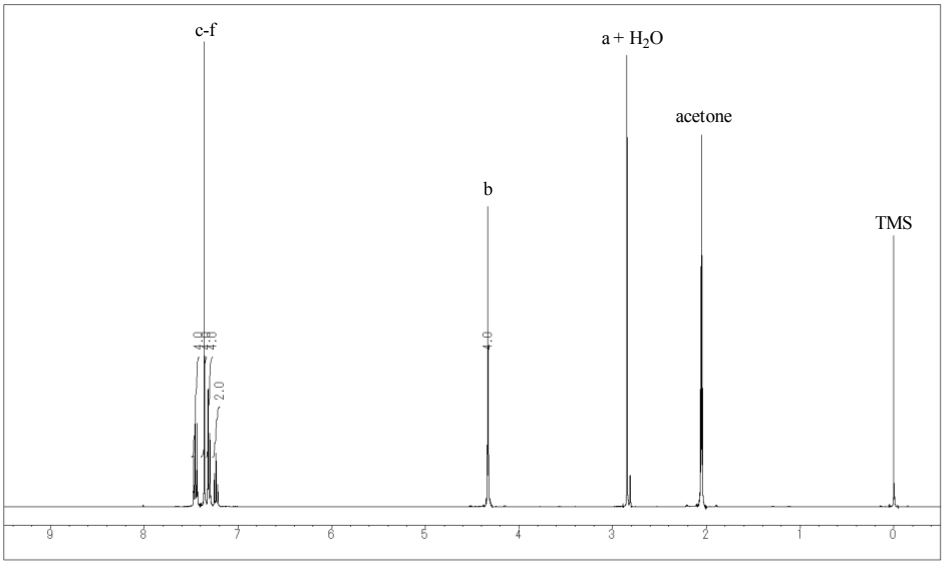
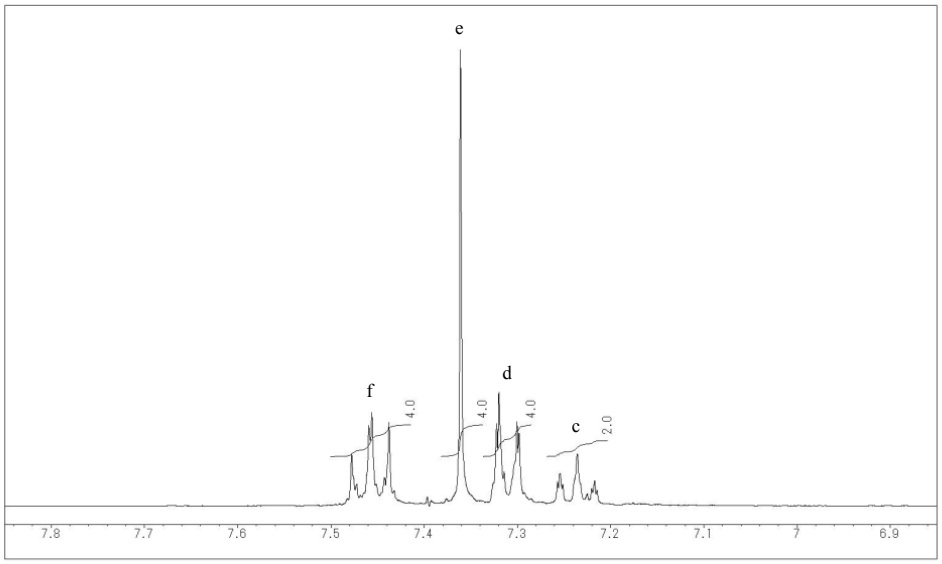


Figure S4. ^{13}C NMR spectrum of **3**.





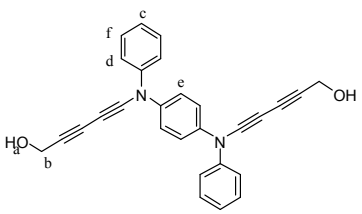


Figure S5. ^{1}H NMR spectra of **4**.

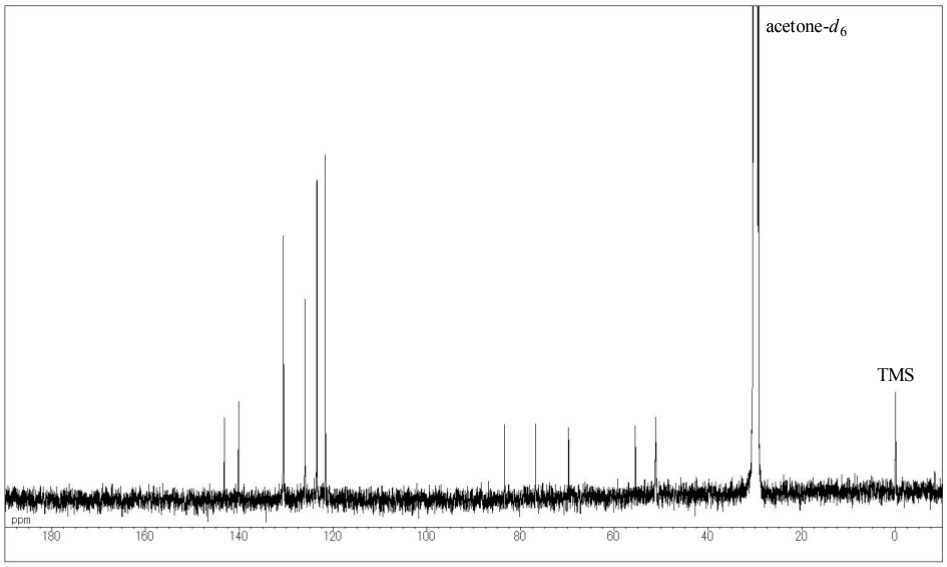


Figure S6. ^{13}C NMR spectrum of **4**.

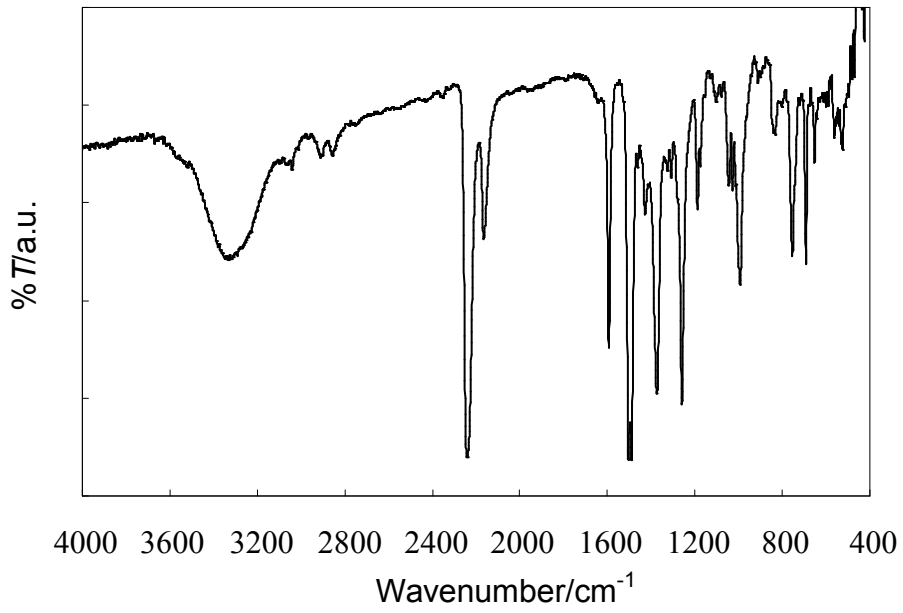


Figure S7. IR spectrum of **4**.

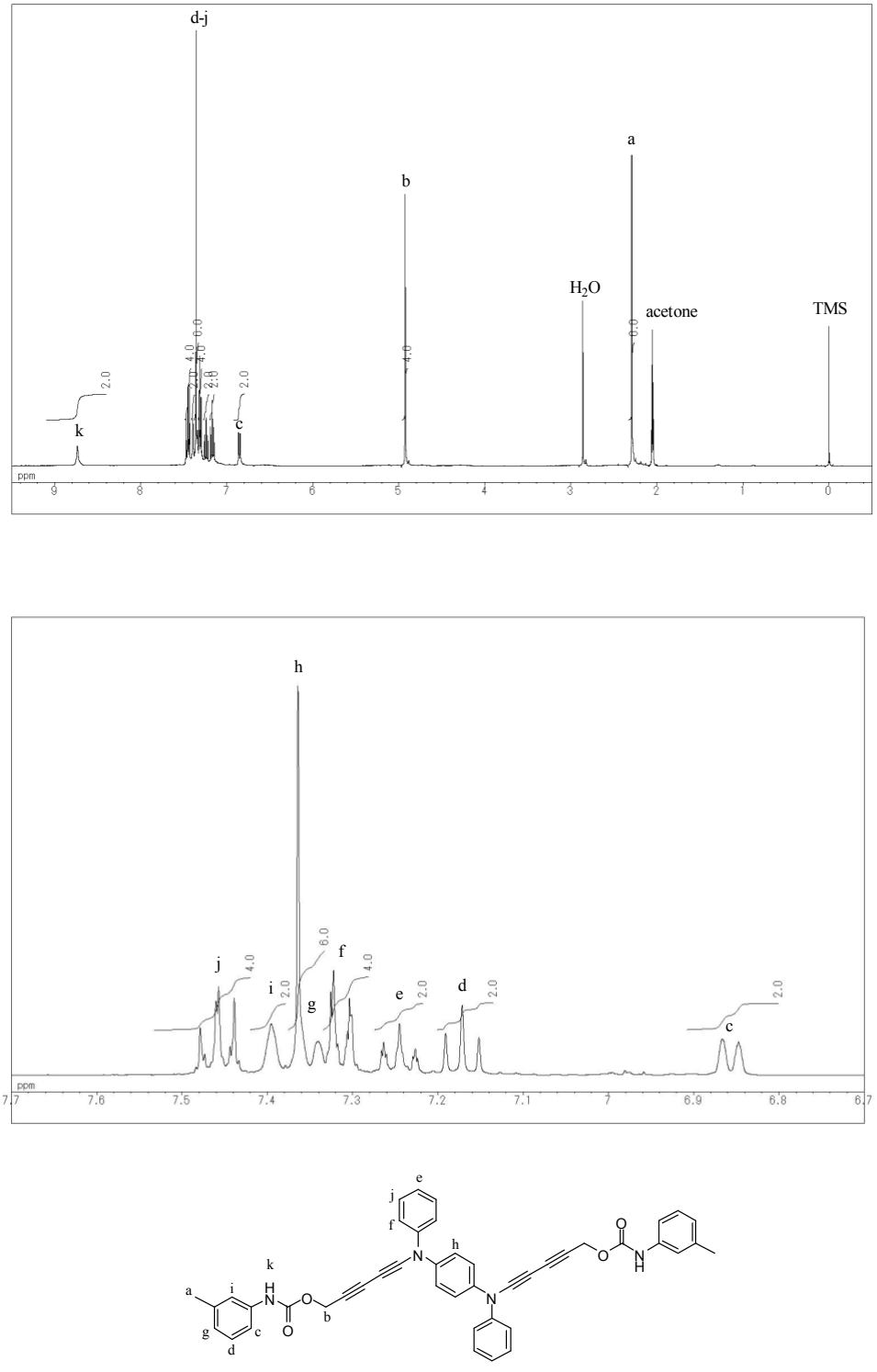


Figure S8. ^{1}H NMR spectra of monomer **1**.

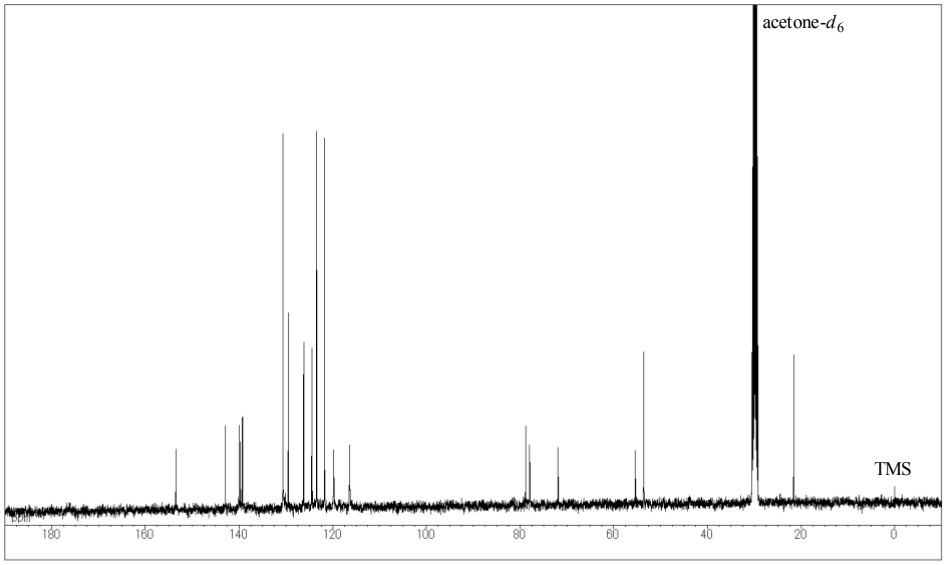


Figure S9. ^{13}C NMR spectrum of monomer **1**.

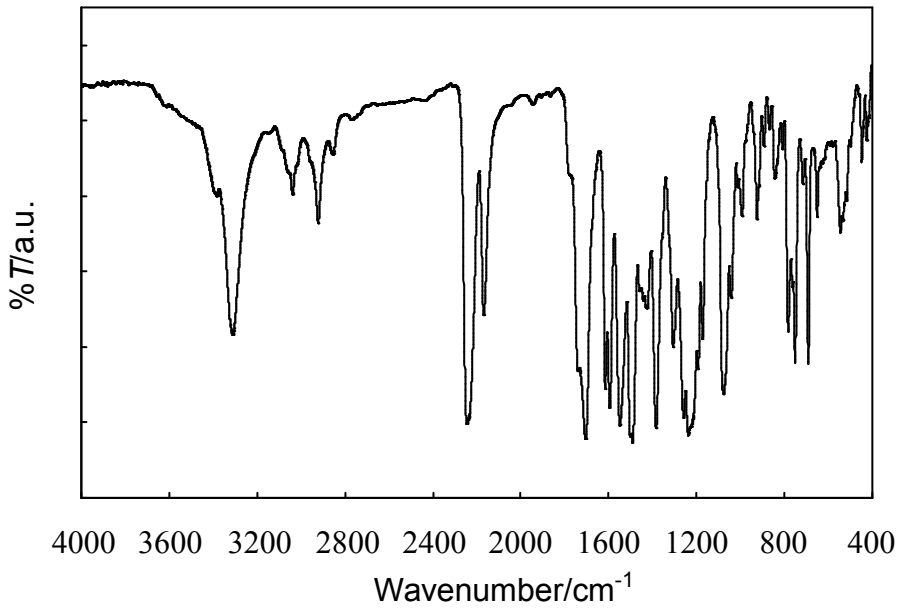


Figure S10. IR spectrum of monomer **1**.

3. Characterization of Polymer 1.

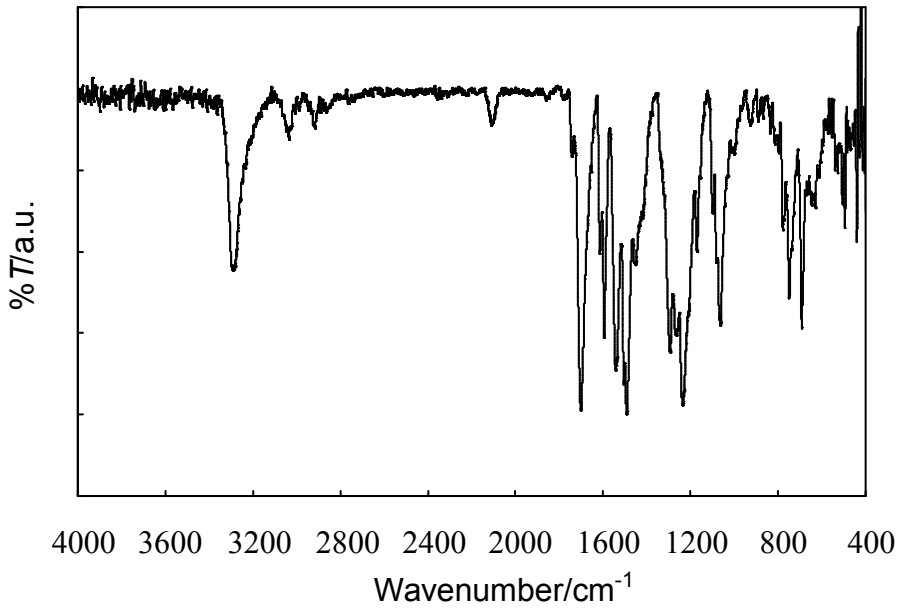


Figure S11. IR spectrum of polymer **1**.