

Mechanochromism of polyurethane based on folding–unfolding of cyano-substituted oligo(*p*-phenylene) dimer

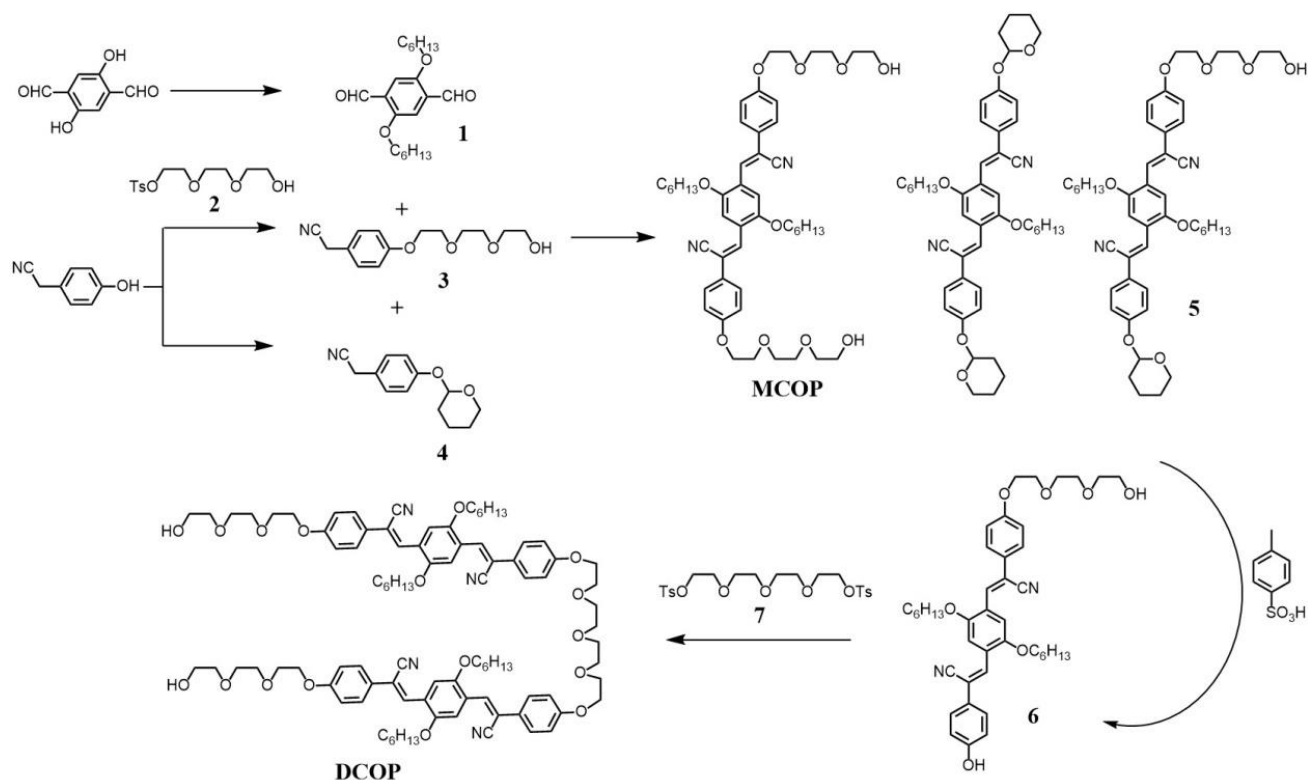
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Supplementary material



Scheme S1 Synthetic routes for MCOP and DCOP.

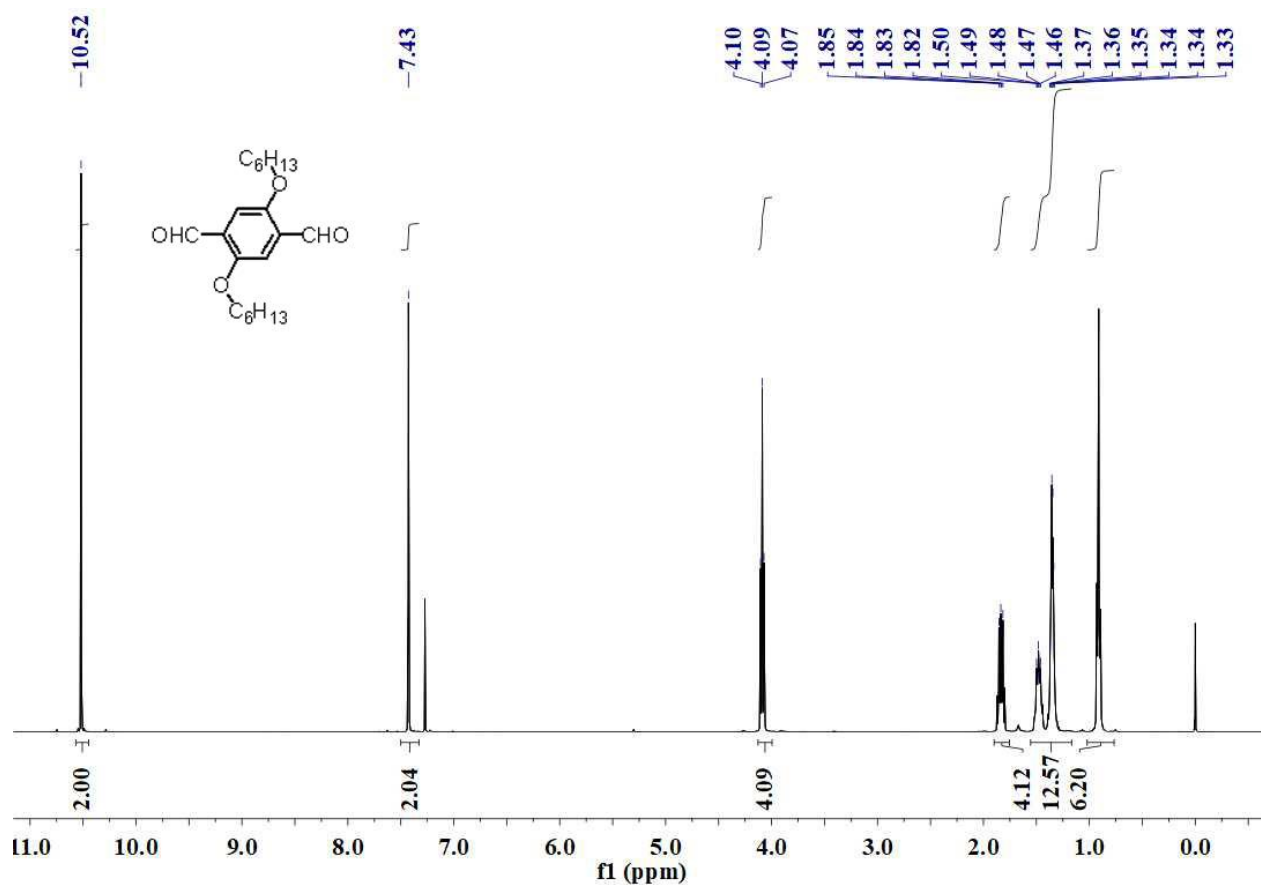


Fig. S1 ¹H NMR spectrum of compound 1 in CDCl₃.

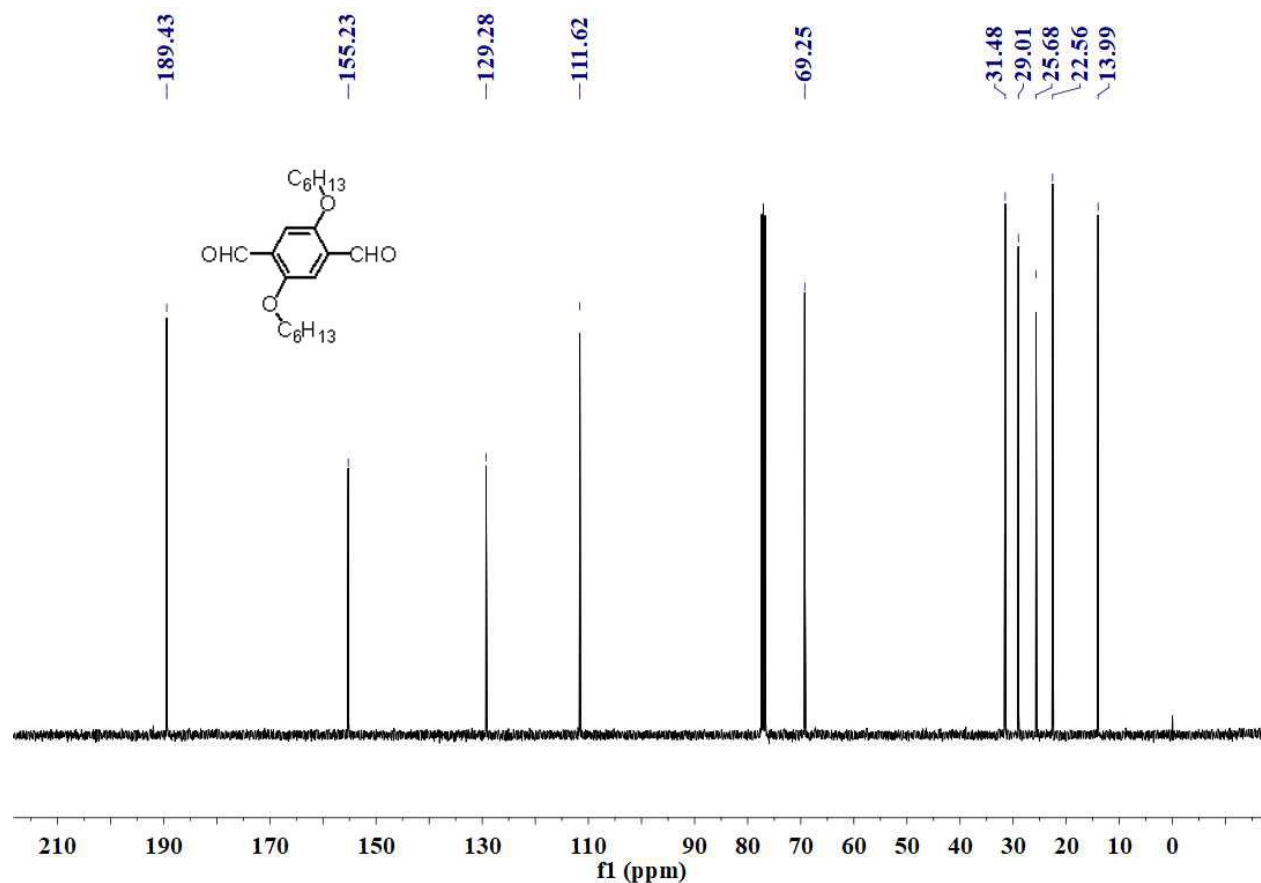


Fig. S2 ¹³C NMR spectrum of compound 1 in CDCl₃.

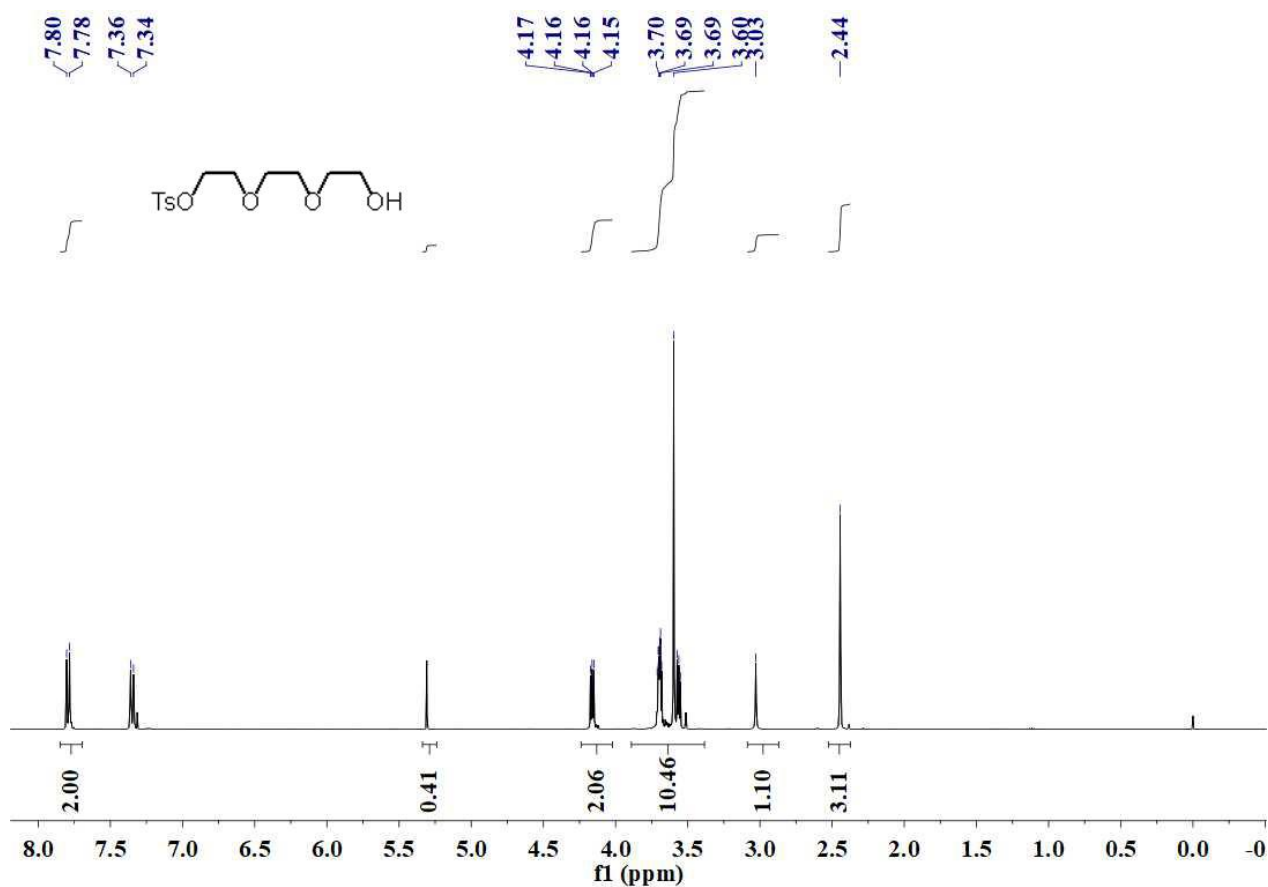


Fig. S3 ^1H NMR spectrum of compound 2 in CDCl_3 .

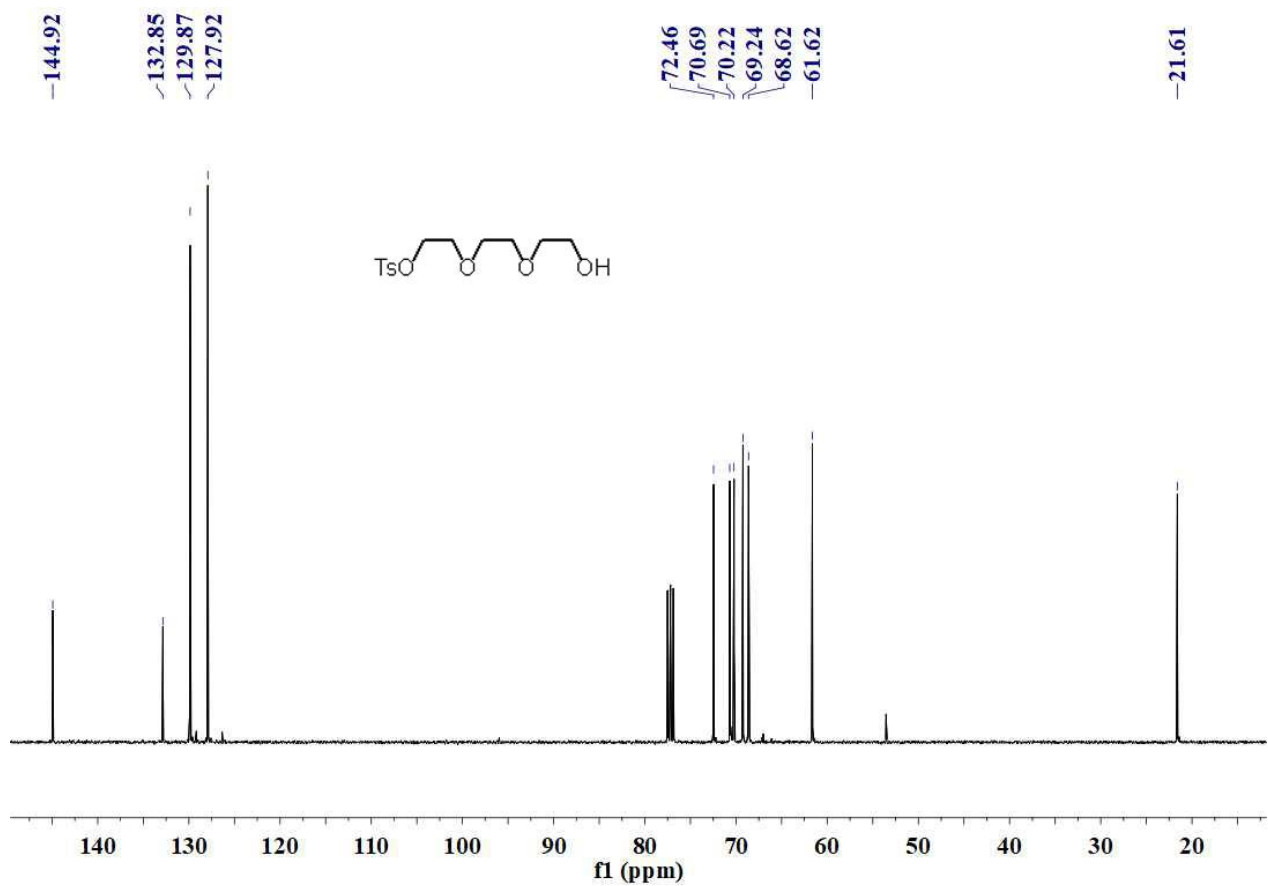


Fig. S4 ^{13}C NMR spectrum of compound 2 in CDCl_3 .

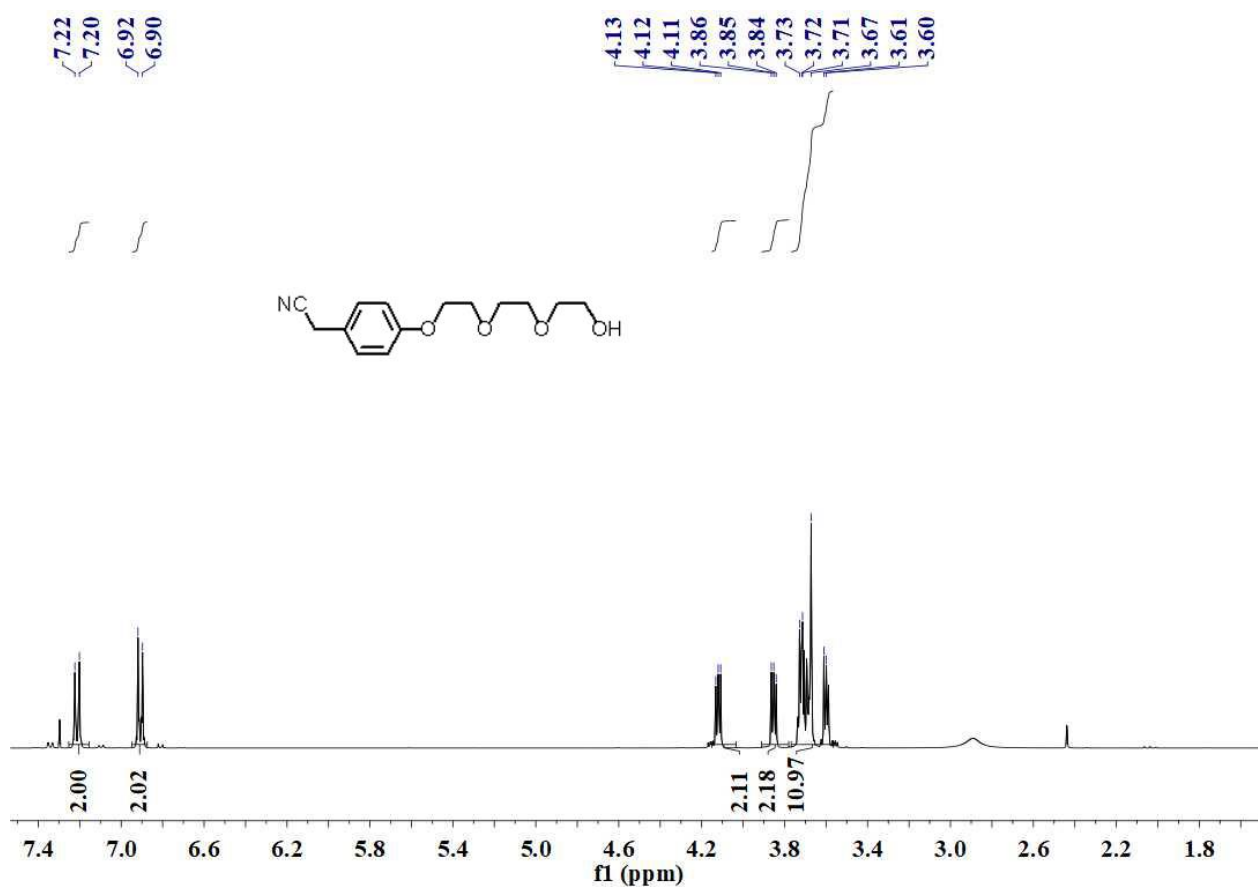


Fig. S5 ^1H NMR spectrum of compound 3 in CDCl_3 .

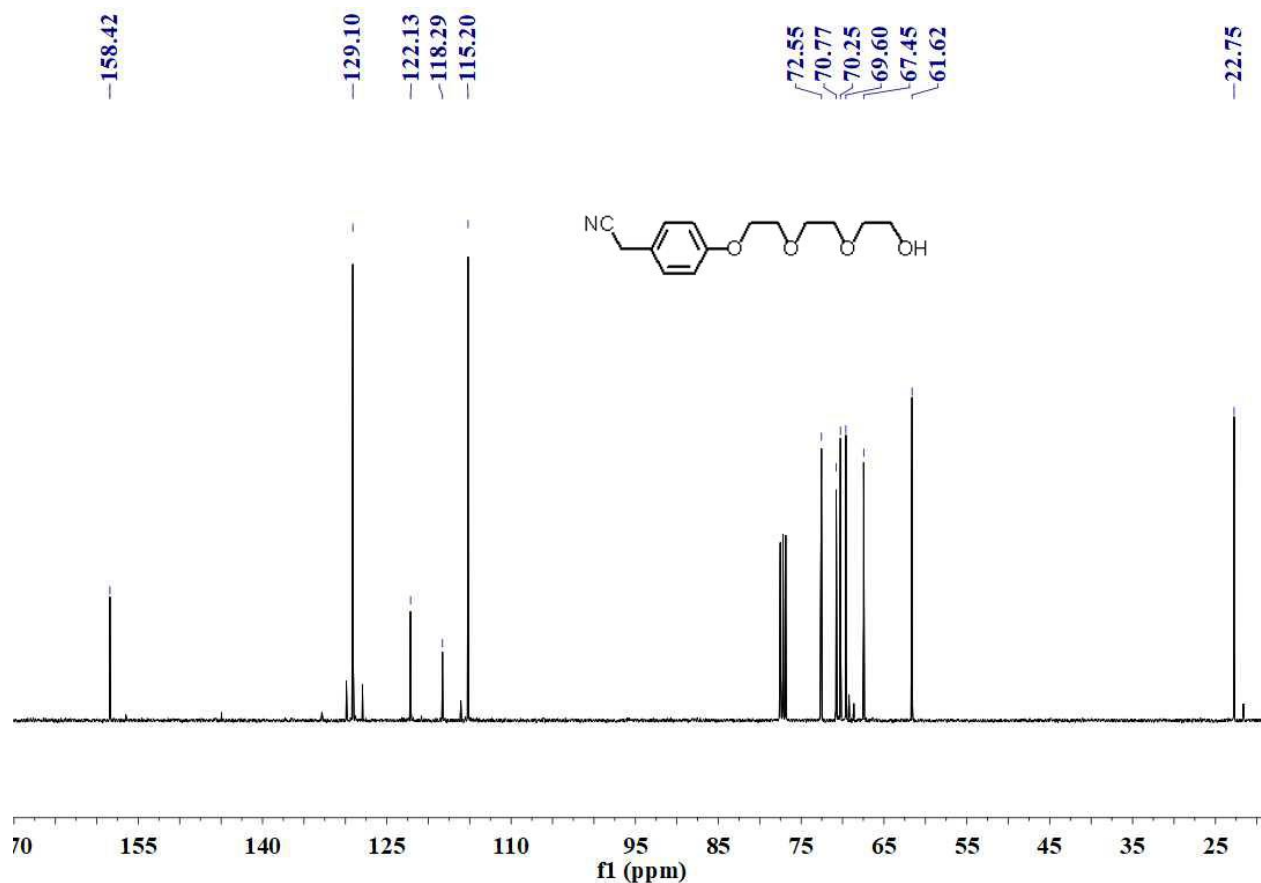


Fig. S6 ^{13}C NMR spectrum of compound 3 in CDCl_3 .

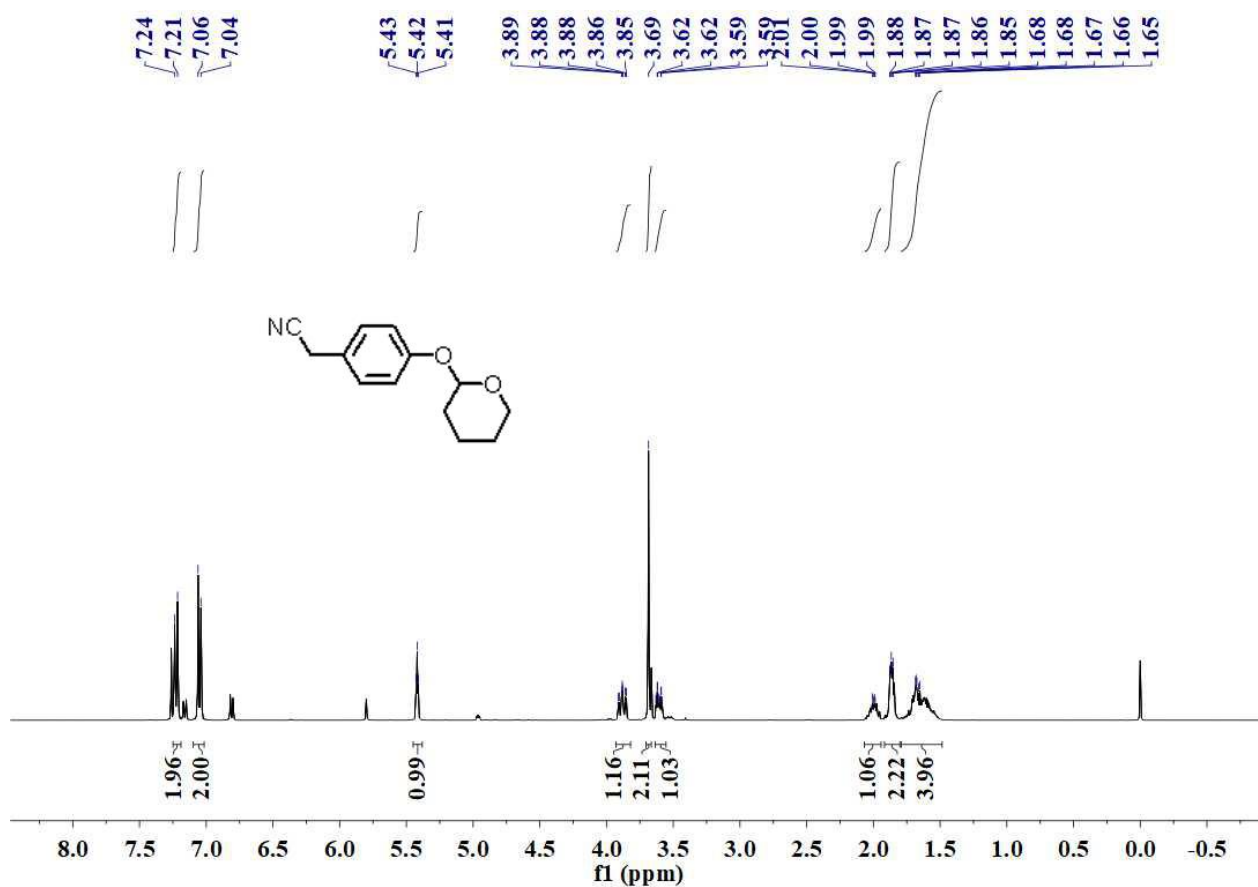


Fig. S7 ¹H NMR spectrum of compound 4 in CDCl₃.

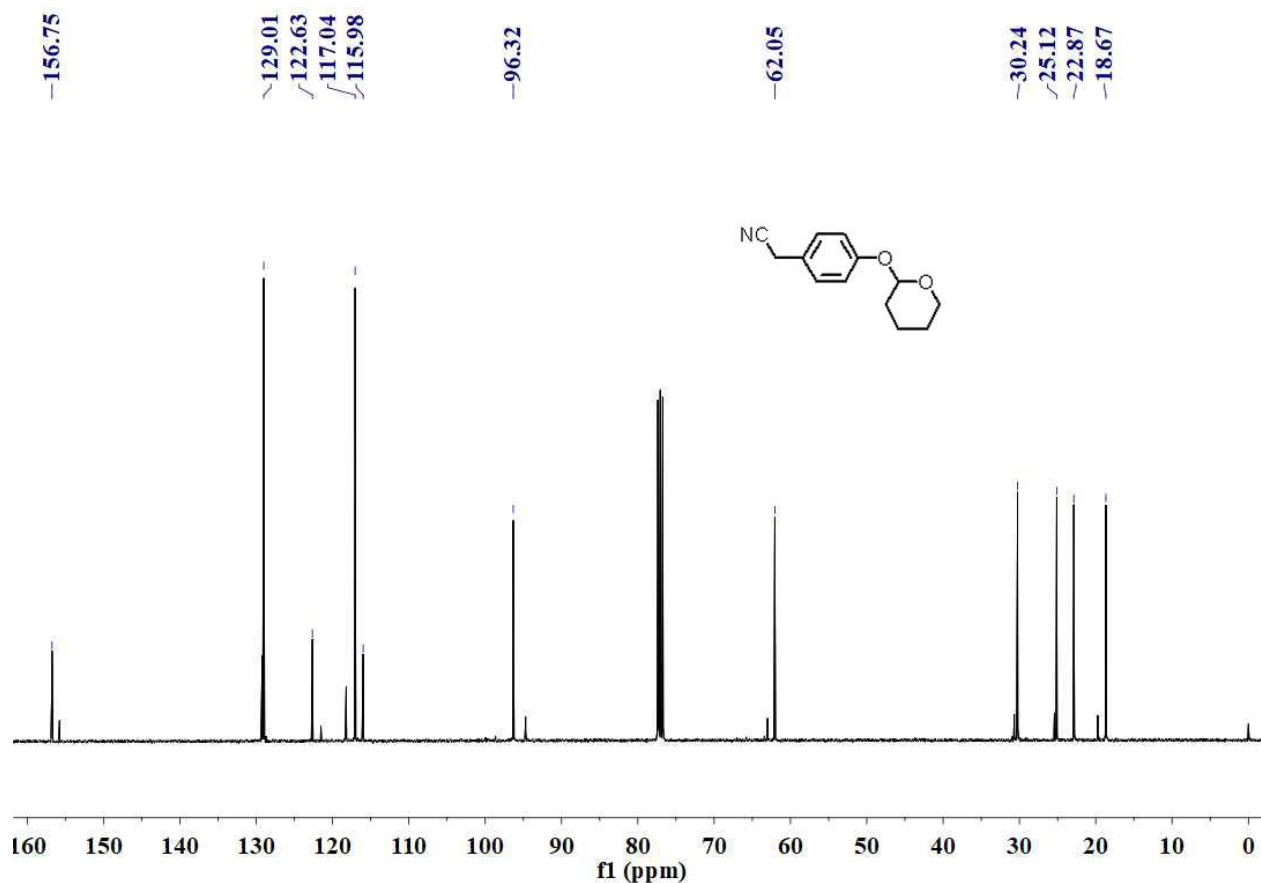


Fig. S8 ¹³C NMR spectrum of compound 4 in CDCl₃.

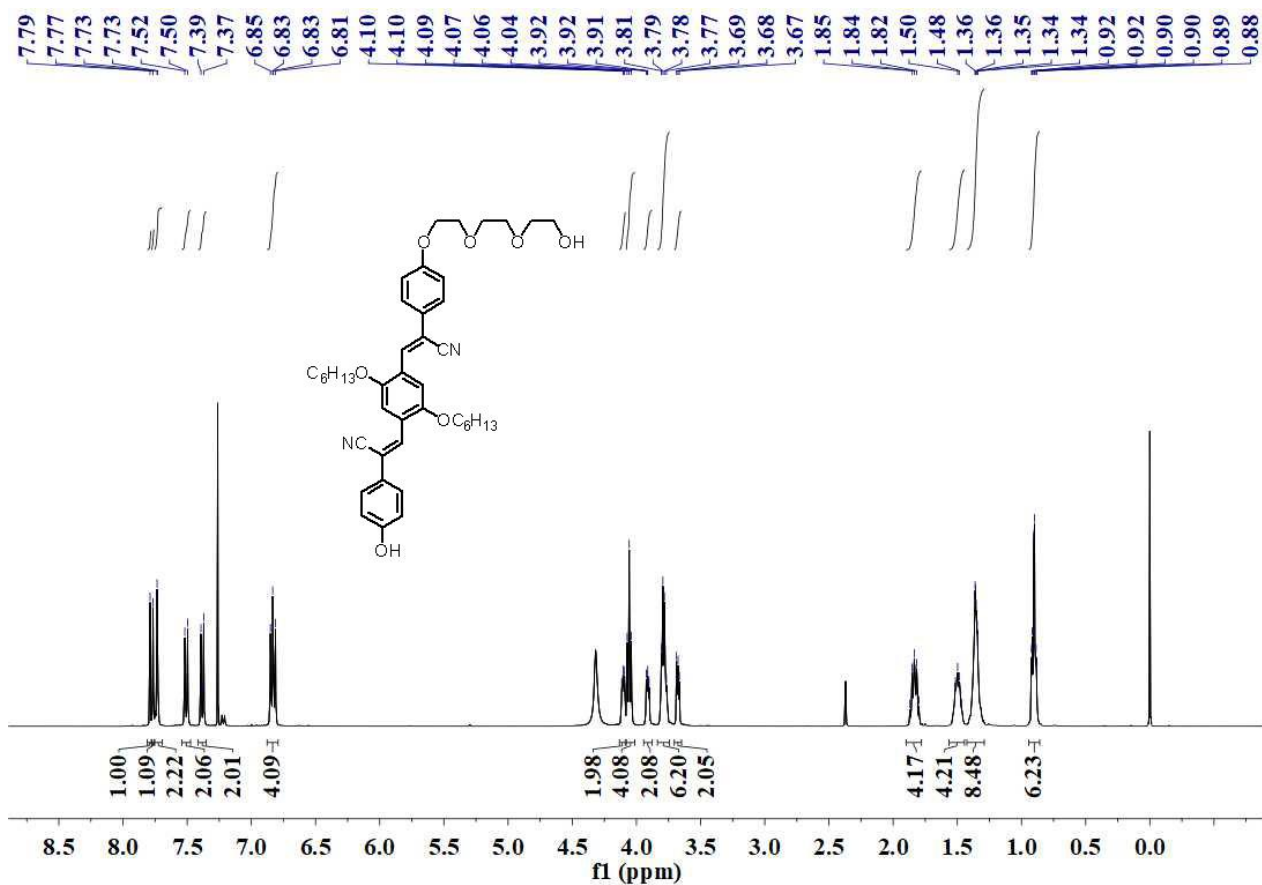


Fig. S9 ¹H NMR spectrum of compound 6 in CDCl₃.

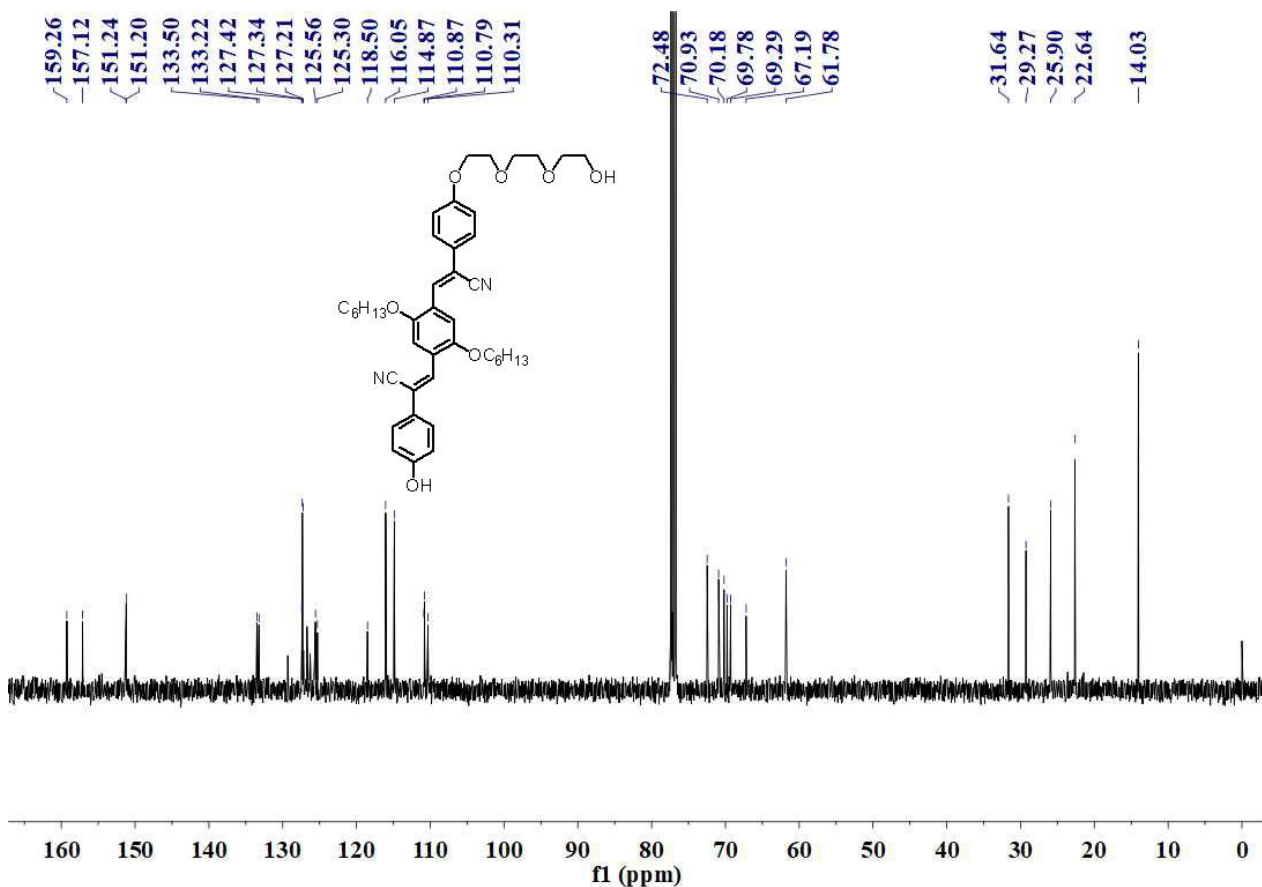


Fig. S10 ¹³C NMR spectrum of compound 6 in CDCl₃.

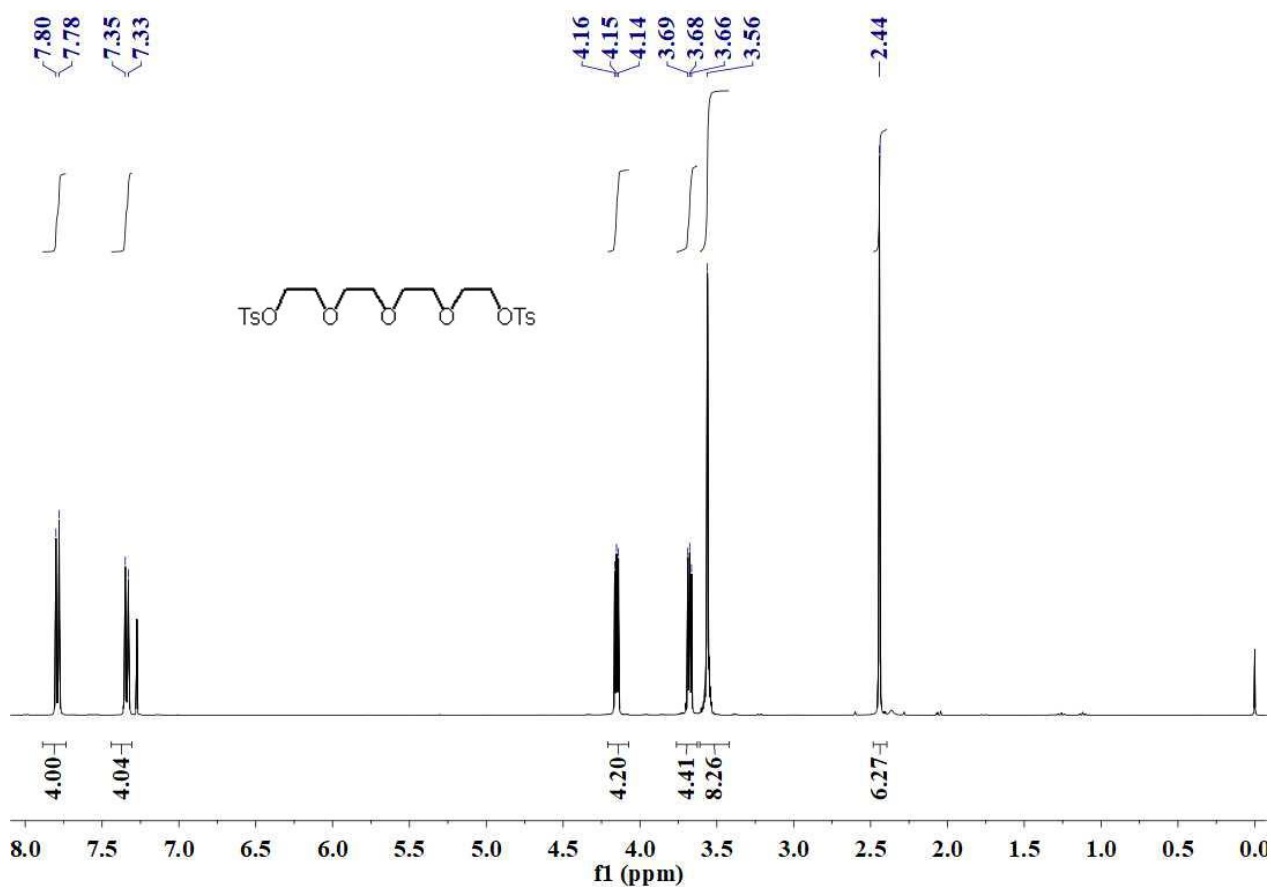


Fig. S11 ^1H NMR spectrum of compound 7 in CDCl_3 .

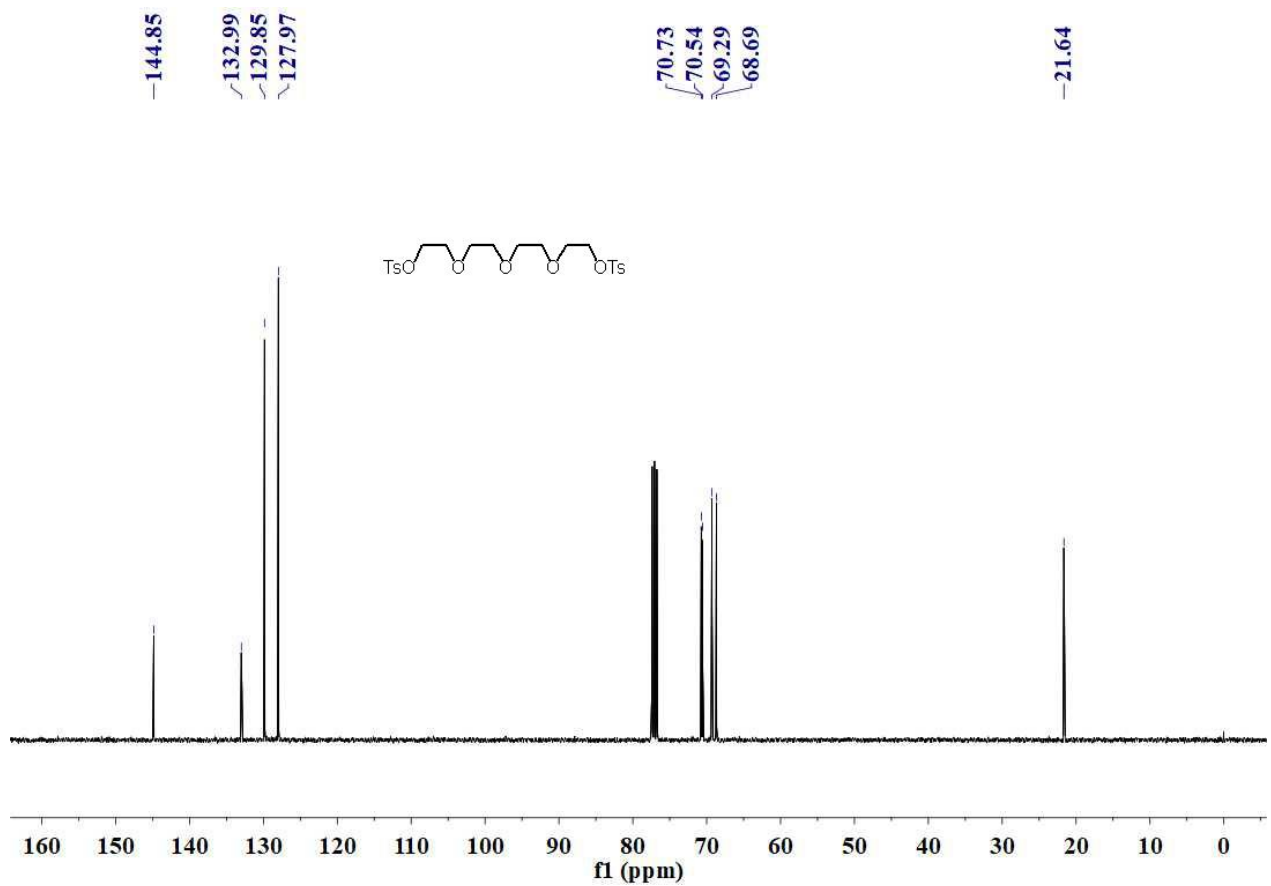


Fig. S12 ^{13}C NMR spectrum of compound 7 in CDCl_3 .

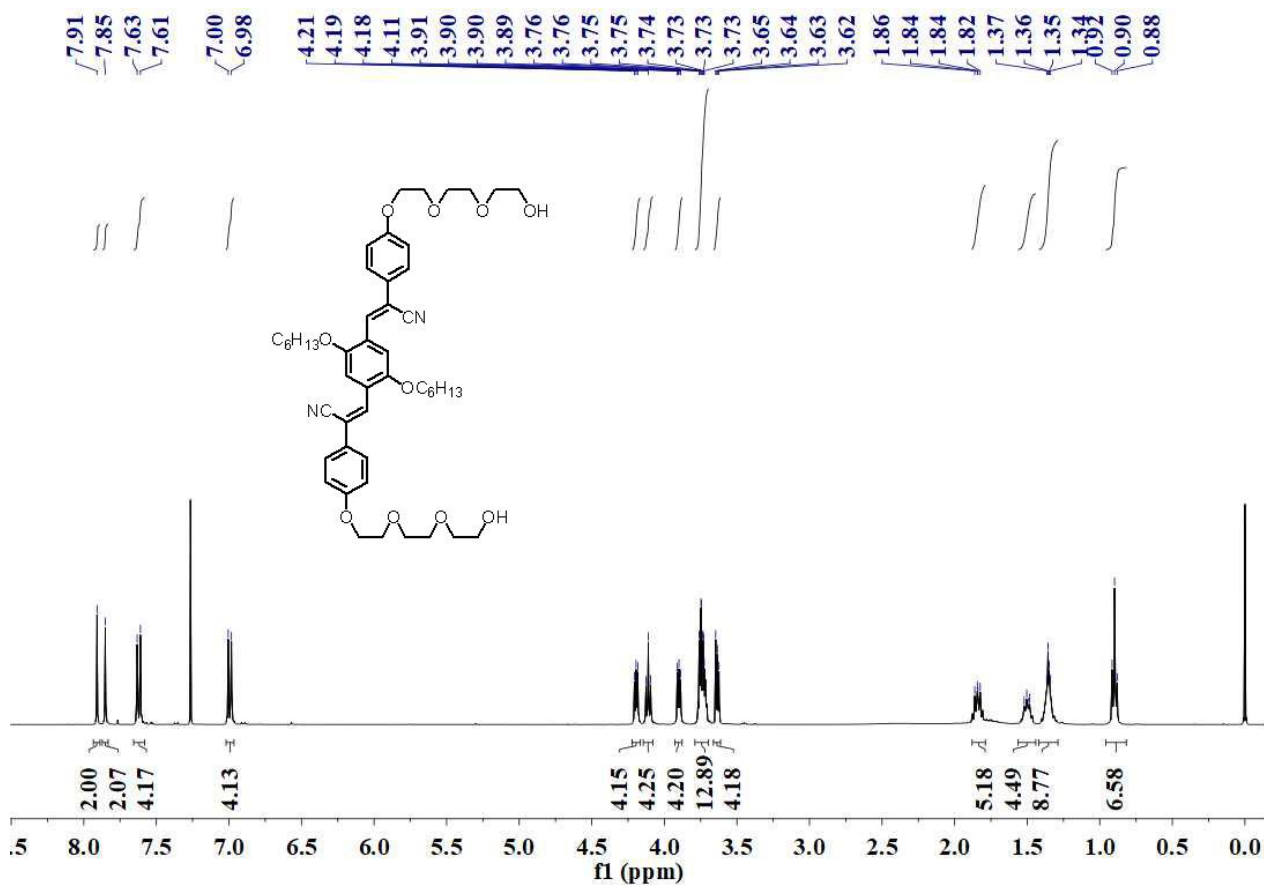


Fig. S13 ¹H NMR spectrum of MCOP in CDCl₃.

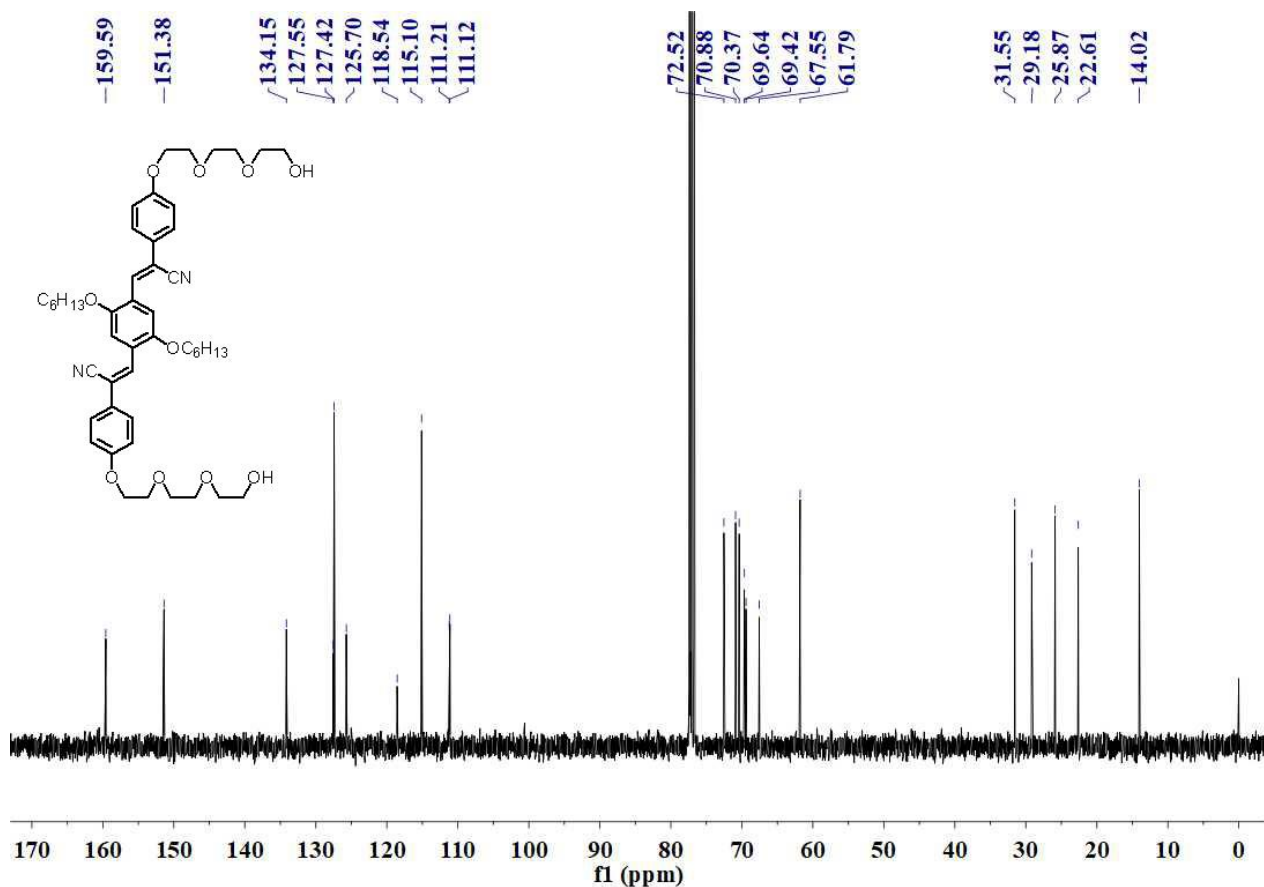


Fig. S14 ¹³C NMR spectrum of MCOP in CDCl₃.

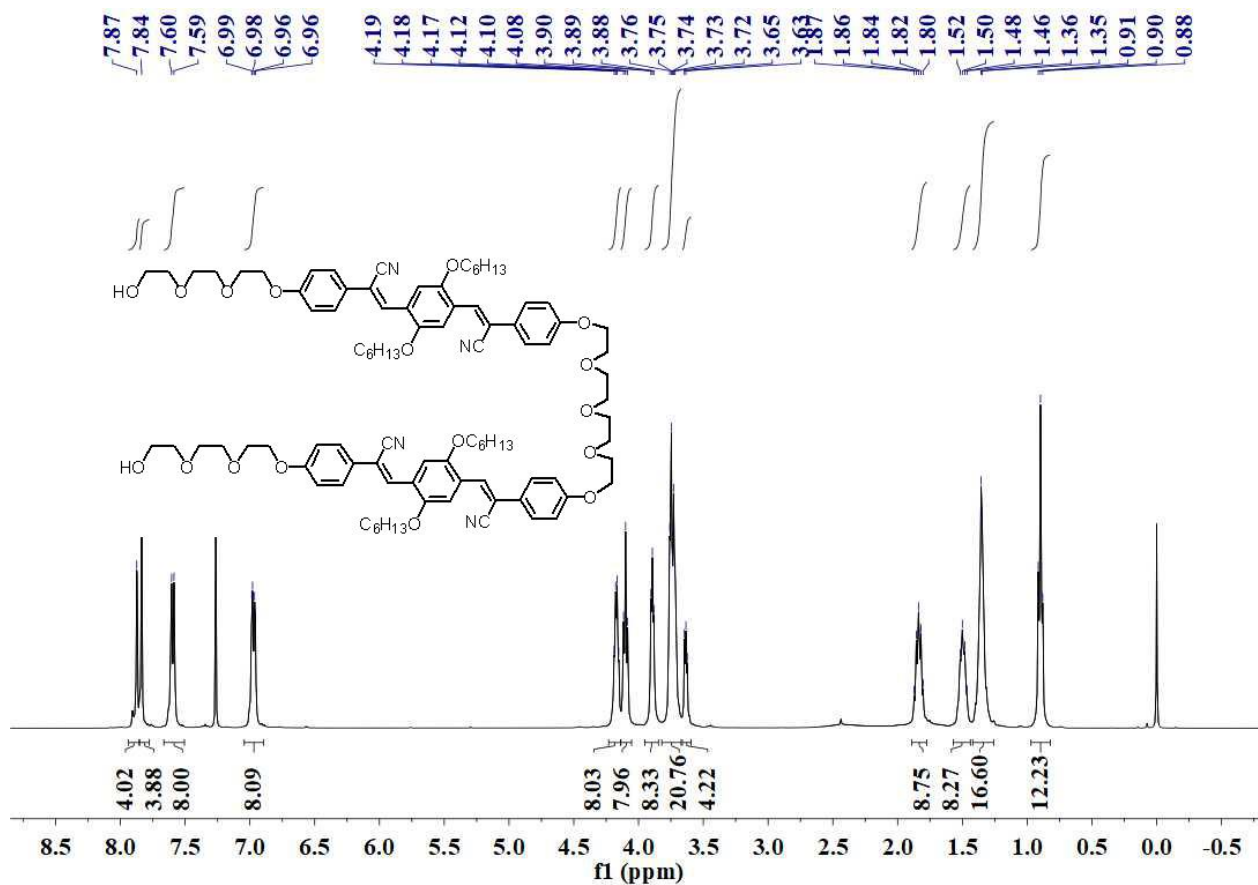


Fig. S15 ¹H NMR spectrum of DCOP in CDCl₃.

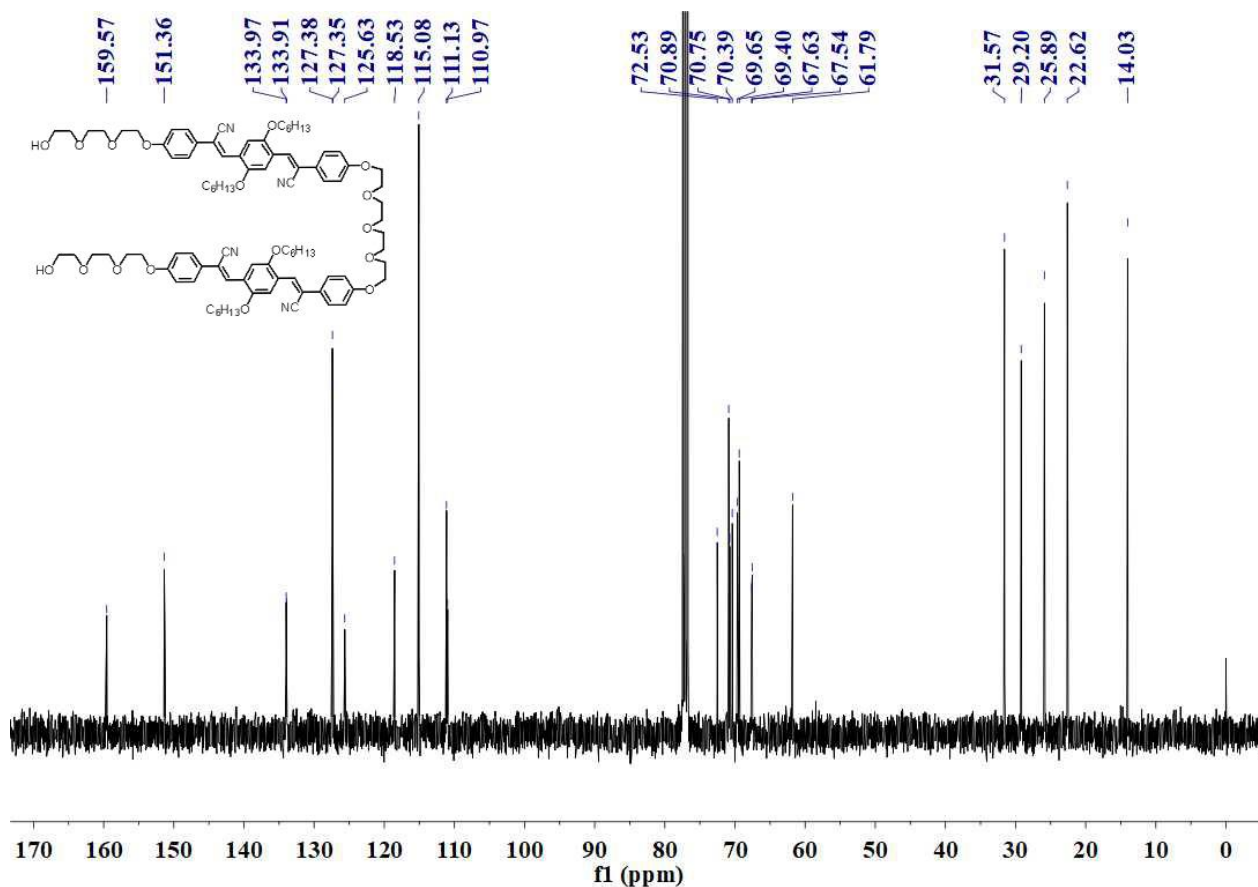


Fig. S16 ¹³C NMR spectrum of DCOP in CDCl₃.

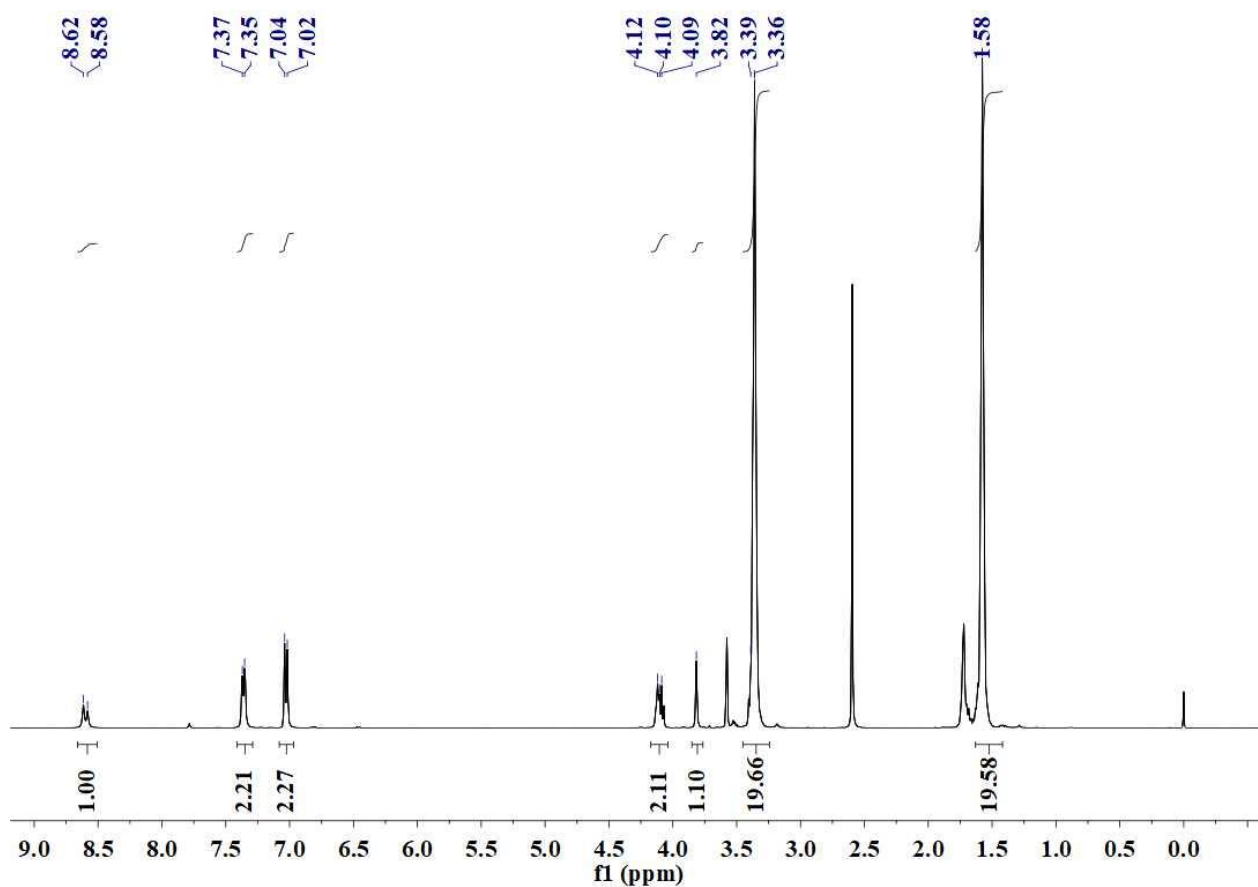


Fig. S17 ^1H NMR spectrum of MPU-0.2 in d_8 -THF.

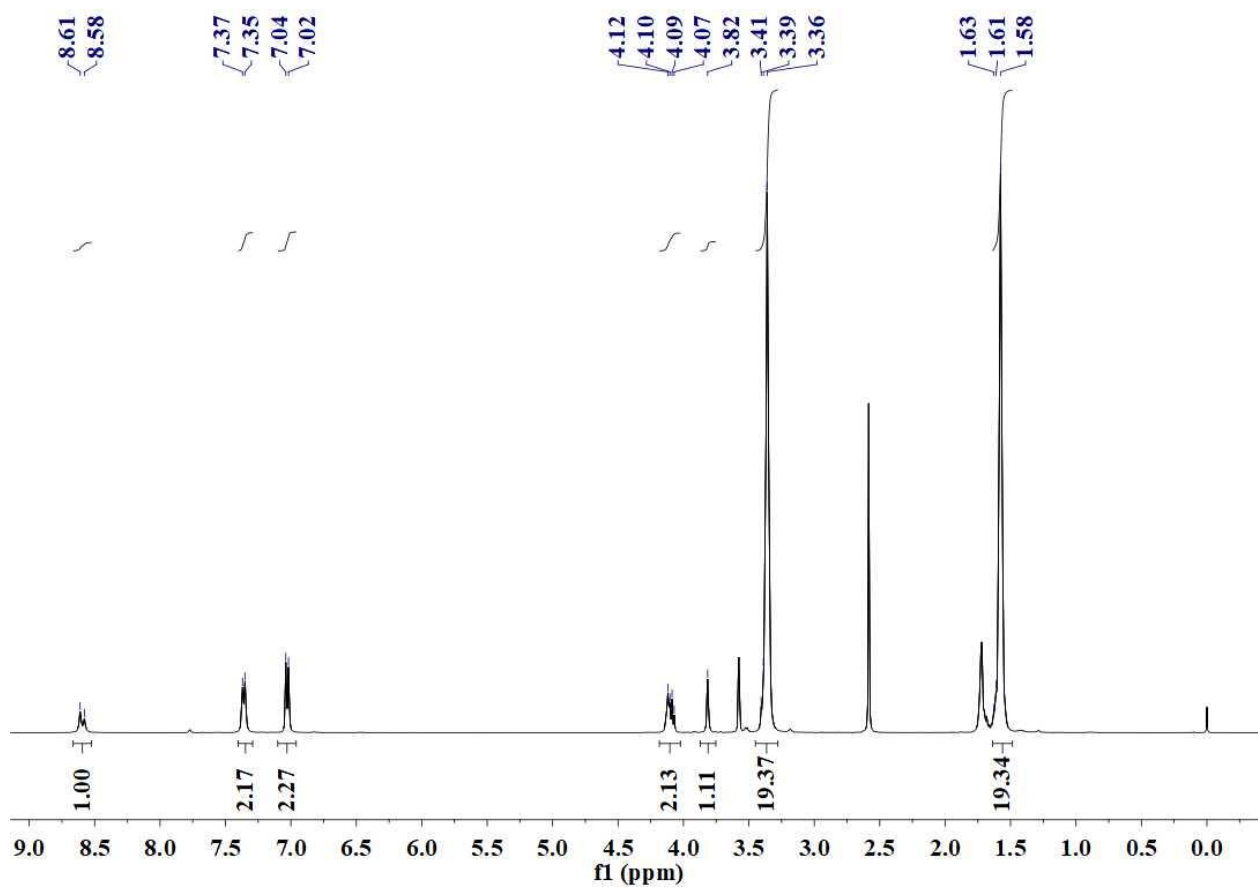


Fig. S18 ^1H NMR spectrum of DPU-0.2 in d_8 -THF.

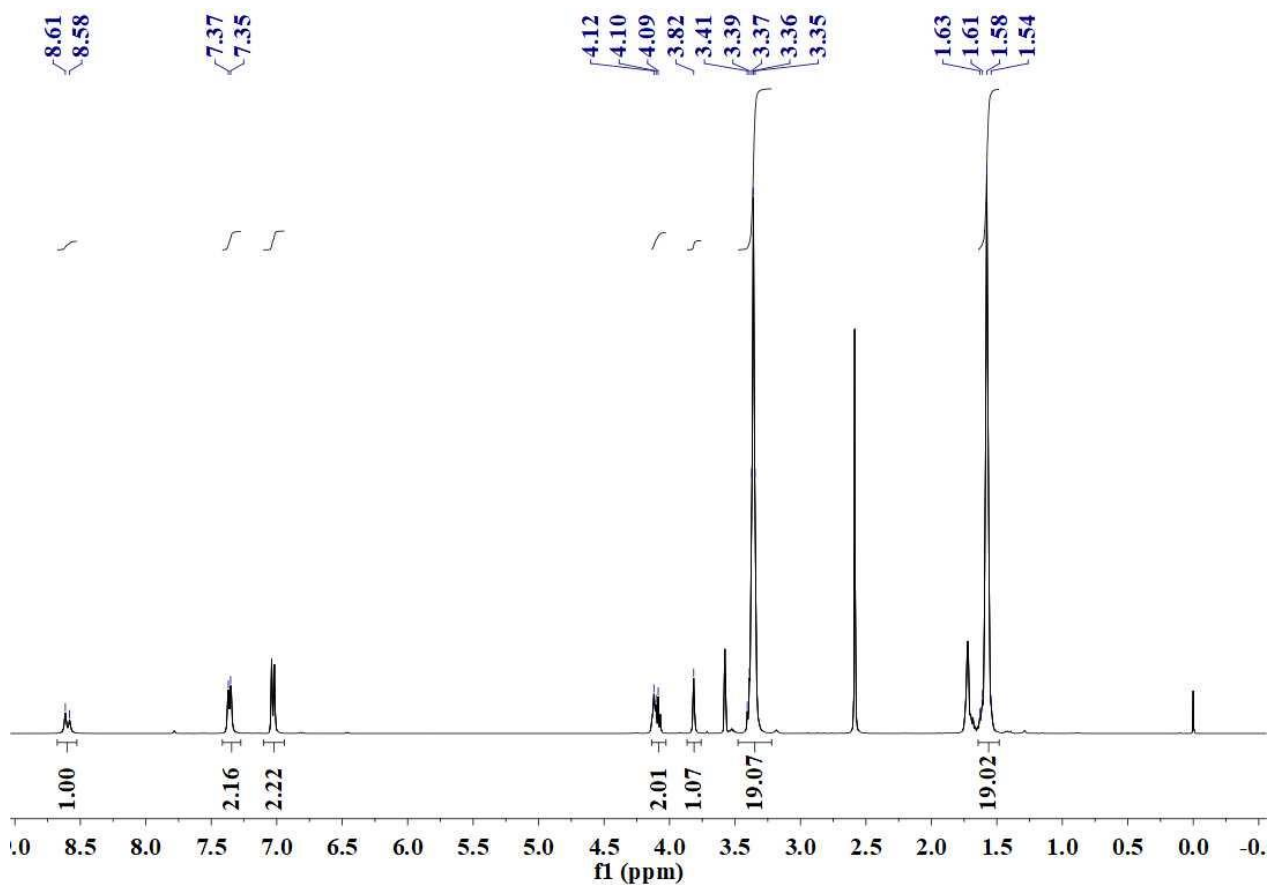


Fig. S19 ^1H NMR spectrum of PU in d_8 -THF.

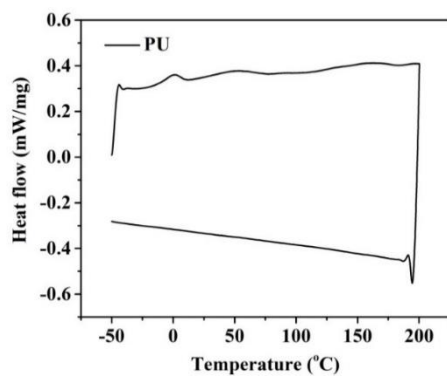


Fig. S20 DSC curve of PU in nitrogen condition.

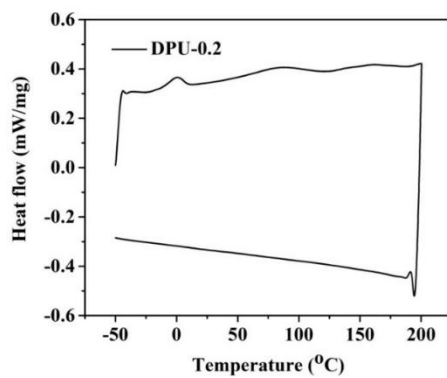


Fig. S21 DSC curve of DPU-0.2 in nitrogen condition.

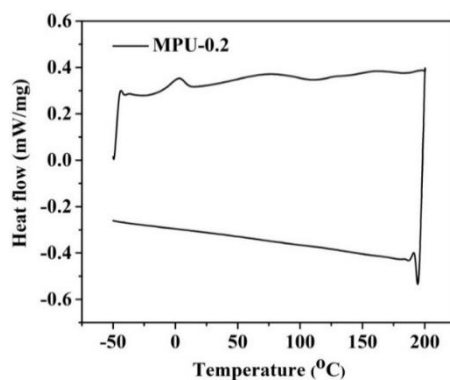


Fig. S22 DSC curve of MPU-0.2 in nitrogen condition.

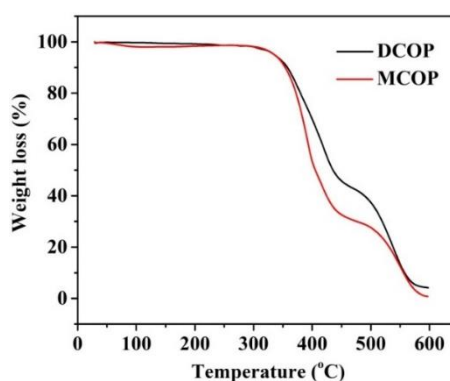


Fig. S23 TG profiles of MCOP and DCOP in air atmosphere.

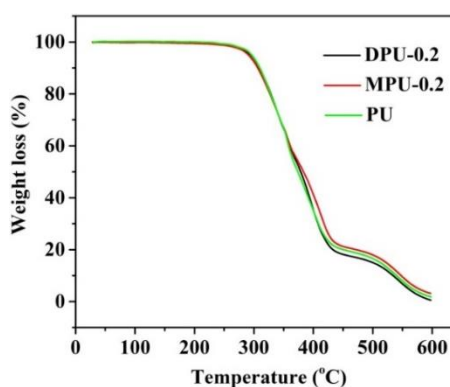


Fig. S24 TG profiles of DPU-0.2, MPU-0.2 and PU in air atmosphere.

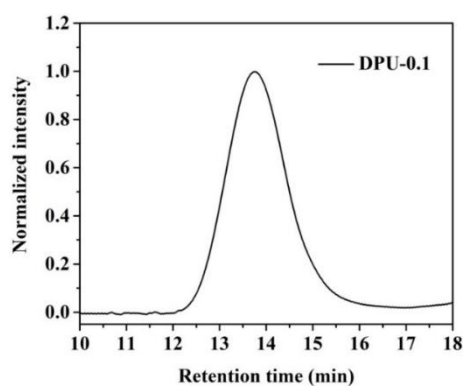


Fig. S25 Gel permeation chromatography trace of DPU-0.1.

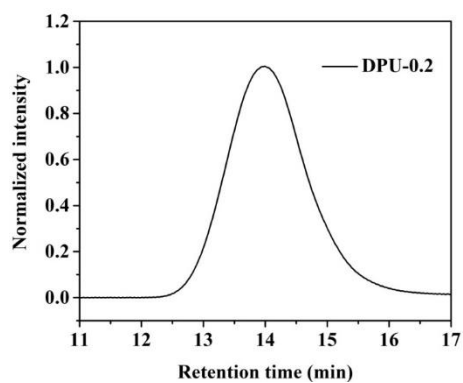


Fig. S26 Gel permeation chromatography trace of **DPU-0.2**.

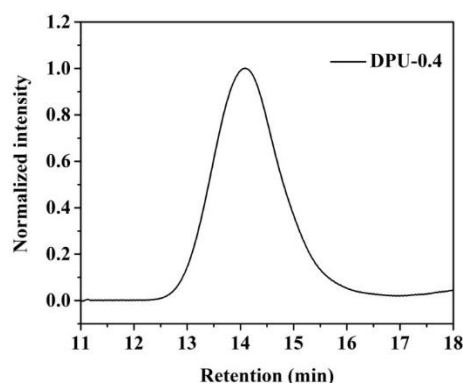


Fig. S27 Gel permeation chromatography trace of **DPU-0.4**.

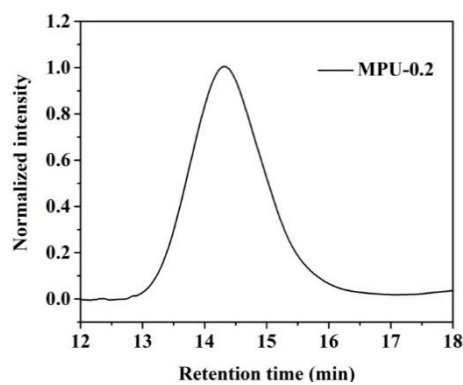


Fig. S28 Gel permeation chromatography trace of **MPU-0.2**.

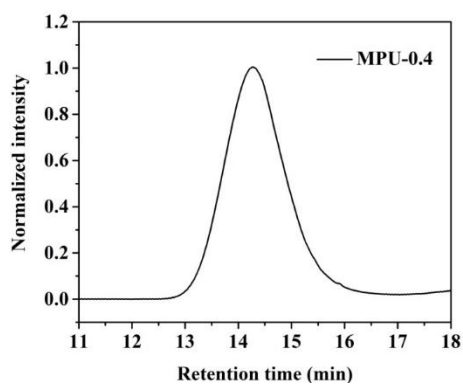


Fig. S29 Gel permeation chromatography trace of **MPU-0.4**.

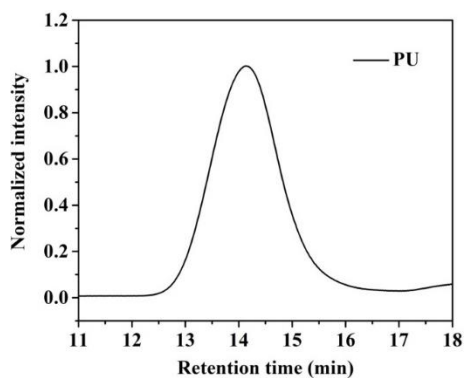


Fig. S30 Gel permeation chromatography trace of PU.

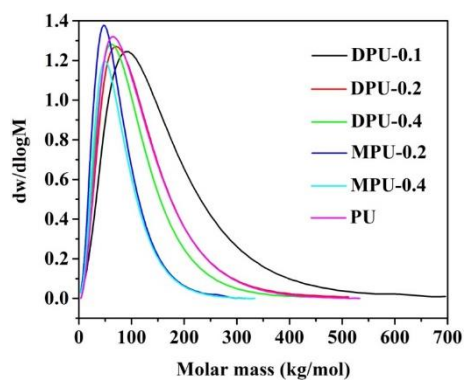


Fig. S31 Molar mass distribution of the polymers.

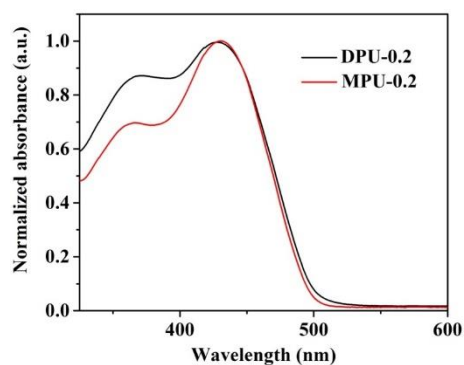


Fig. S32 Normalized absorption spectra of DPU-0.2 and MPU-0.2 in THF solution.

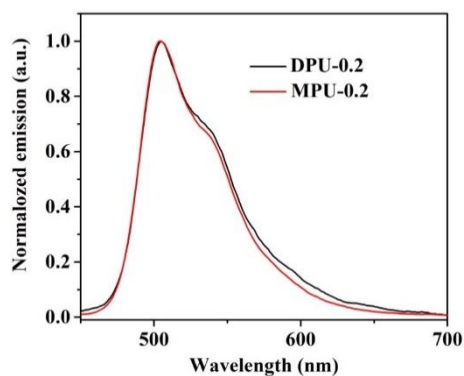


Fig. S33 Normalized fluorescent spectra of DPU-0.2 and MPU-0.2 in THF solution.

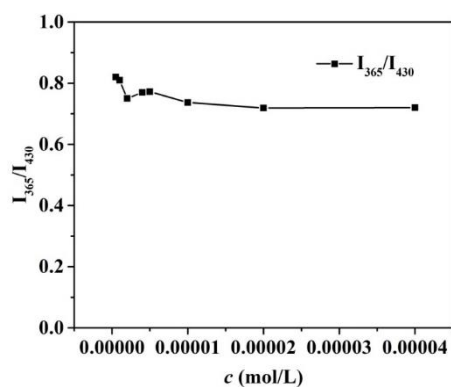


Fig. S34 I_{365}/I_{430} ratios in the absorption spectrum of DCOP under different concentrations.

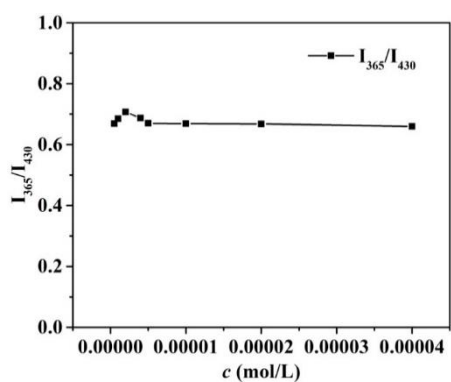


Fig. S35 I_{365}/I_{430} ratios in the absorption spectrum of MCOP under different concentrations.

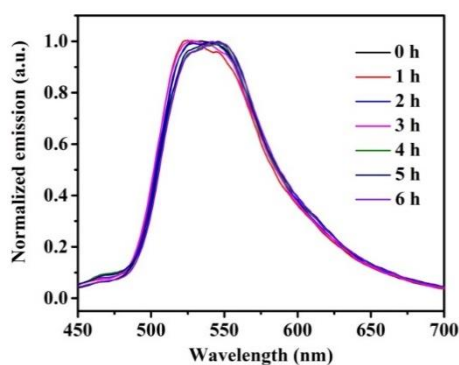


Fig. S36 Fluorescent spectra of the DPU-0.2 film after thermal treatment at 50 °C with different durations.

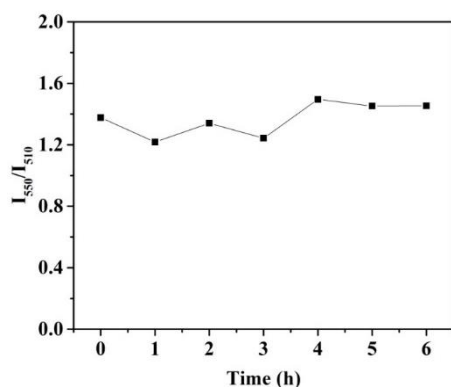


Fig. S37 I_{550}/I_{510} emission ratios of the DPU-0.2 film after thermal treatment at 50 °C with different durations.

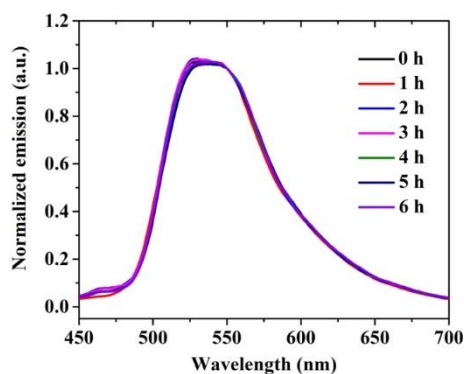


Fig. S38 Fluorescent spectra of the **DPU-0.2** film after thermal treatment at 70 °C with different durations.

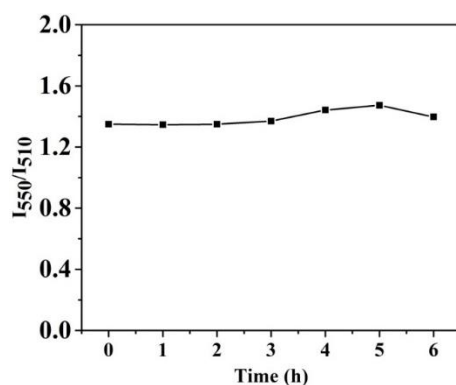


Fig. S39 I_{550}/I_{510} emission ratios of the **DPU-0.2** film after thermal treatment at 70 °C with different durations.

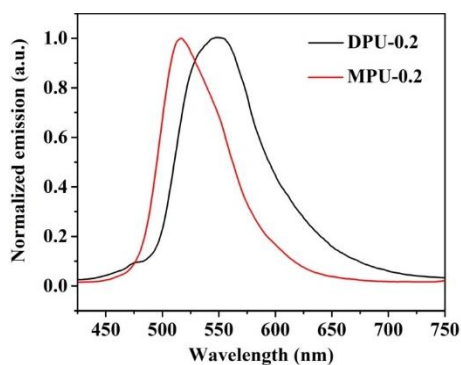


Fig. S40 Solid-state fluorescent spectra of **DPU-0.2** and **MPU-0.2** films.

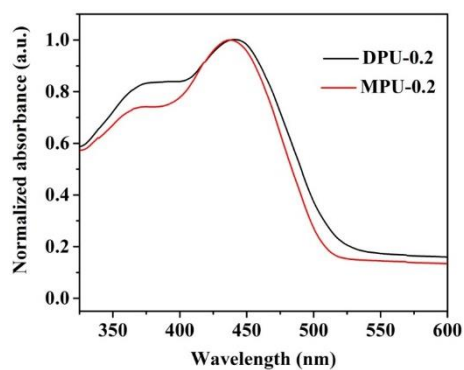


Fig. S41 Solid-state absorption spectra of **DPU-0.2** and **MPU-0.2** films.

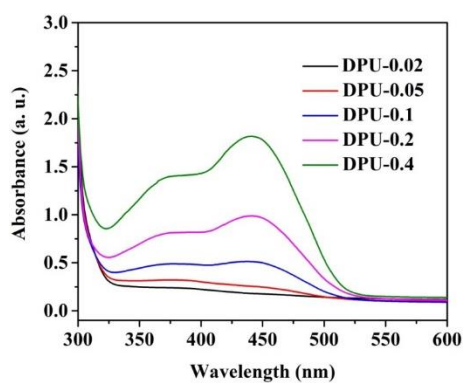


Fig. S42 Solid-state absorption spectra of the **DPU** film.

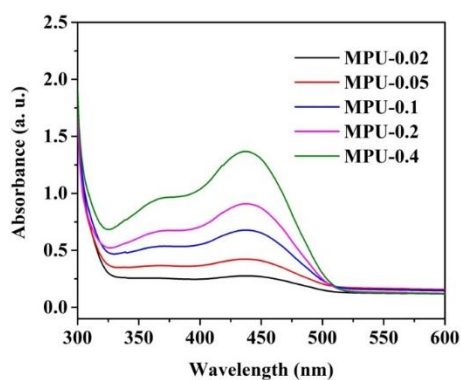


Fig. S43 Solid-state absorption spectra of the **MPU** film.

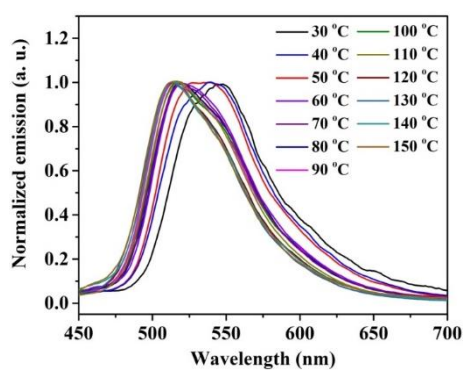


Fig. S44 Fluorescent spectra of the **DPU-0.2** film at different temperatures.

WTS20221122B #13 RT: 0.19 AV: 1 NL: 9.49E6
T: FTMS + p ESI Full ms [100.0000-1500.0000]

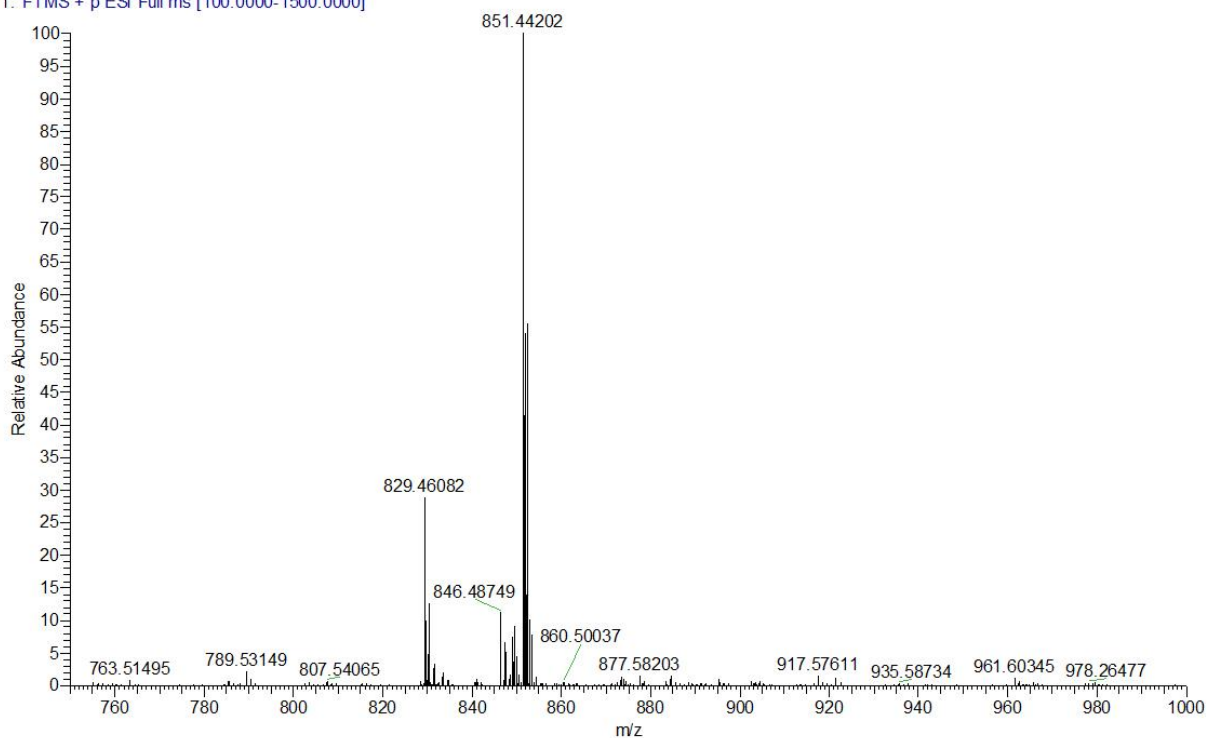


Fig. S45 HRMS spectrum of MCOP.

WTS20221122A #13 RT: 0.20 AV: 1 NL: 1.08E5
T: FTMS + p ESI Full ms [150.0000-2250.0000]

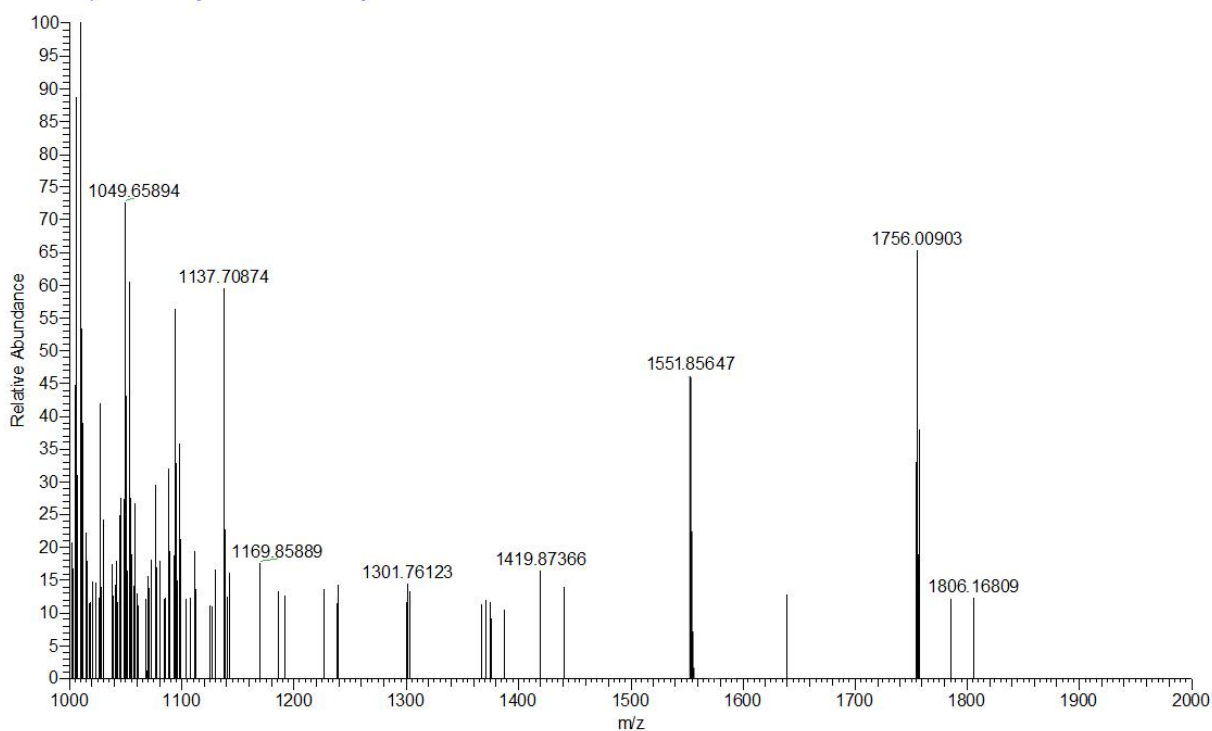


Fig. S46 HRMS spectrum of DCOP.

Videos 1 and 2 are at <https://doi.org/10.1007/s11706-023-0640-1>.