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Supporting Information for

Catalyst-Free Click Cascade Functionalization of Unsaturated-Bond-Containing Polymers Using Masked-Ketene-Tethering Nitrile *N*-Oxide

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Email: yasuhito.koyama@cat.hokudai.ac.jp, ttakata@polymer.titech.ac.jp

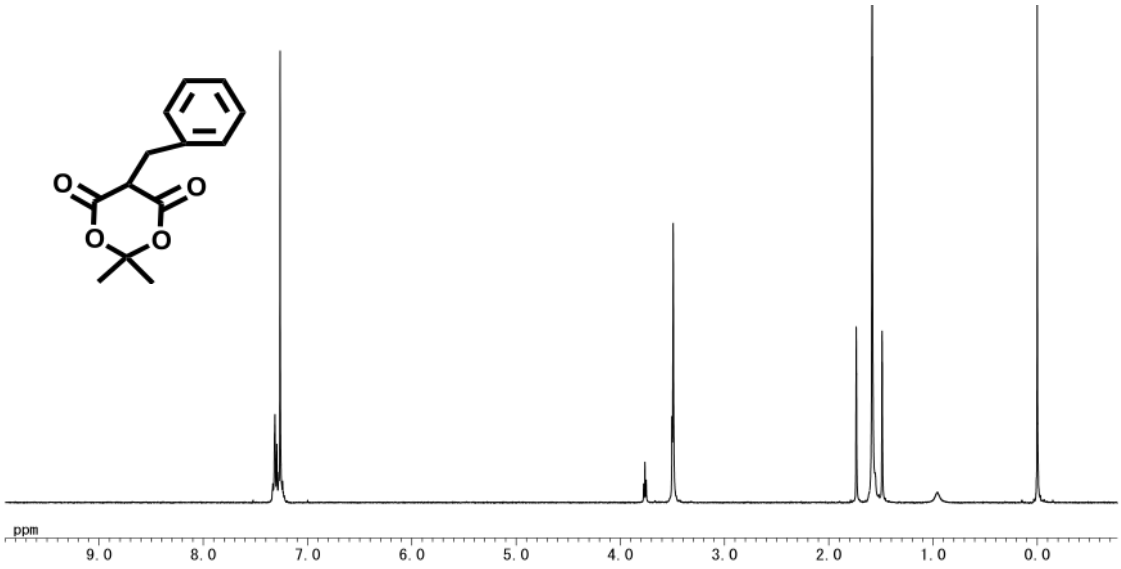
^{1}H NMR, ^{13}C NMR, and IR spectra of all new compounds

Comparison of IR spectra between before and after functionalization or cross-linking reaction.

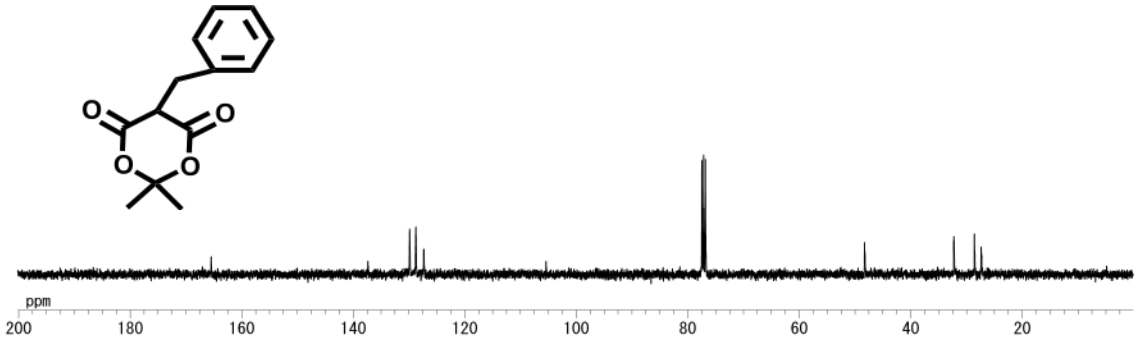
SEC profiles of PAN, functionalized PAN, and PEG-graft PAN

TGA profile of **3**

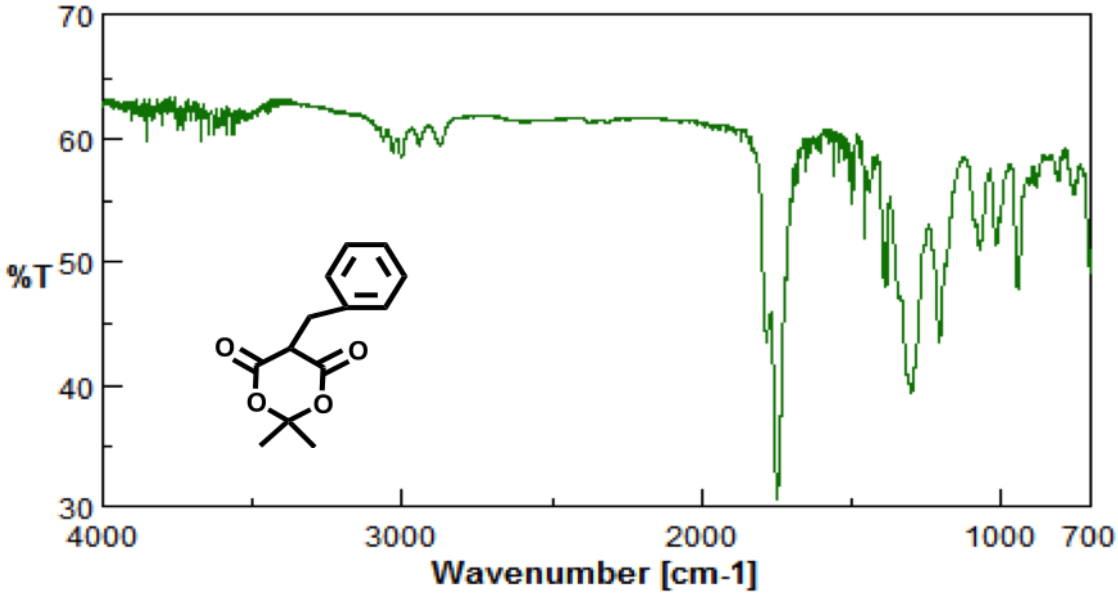
^{1}H NMR, ^{13}C NMR, and IR Spectra



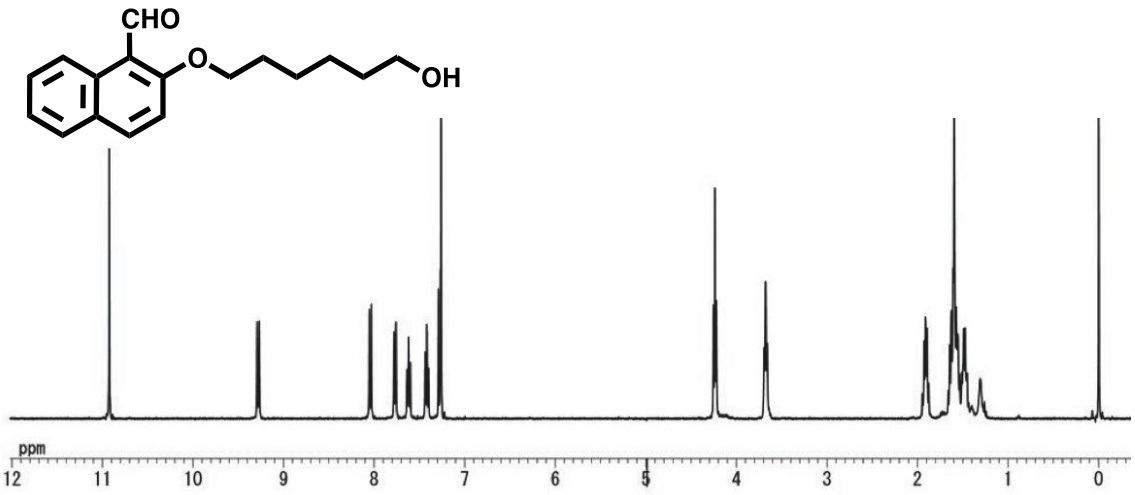
^{1}H NMR spectrum of **A** (400 MHz, $CDCl_3$, 298 K).



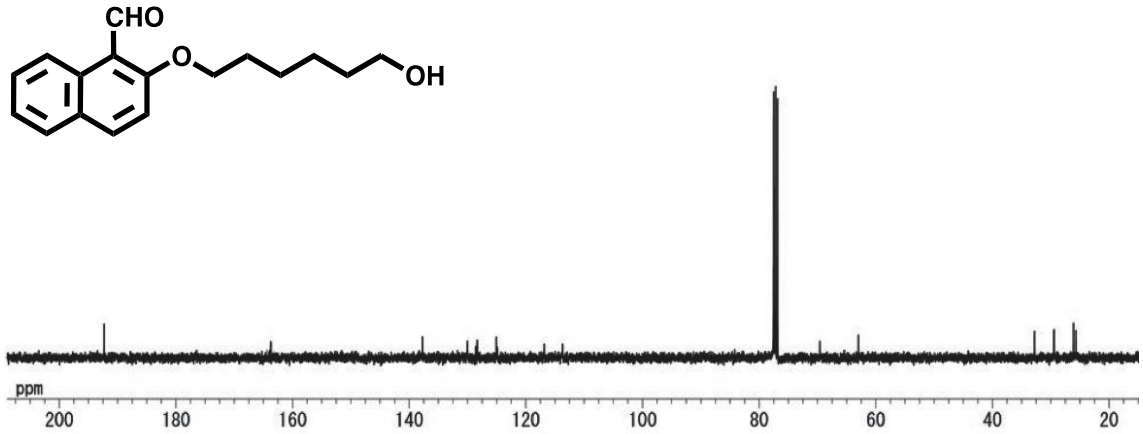
^{13}C NMR spectrum of **A** (100 MHz, $CDCl_3$, 298 K).



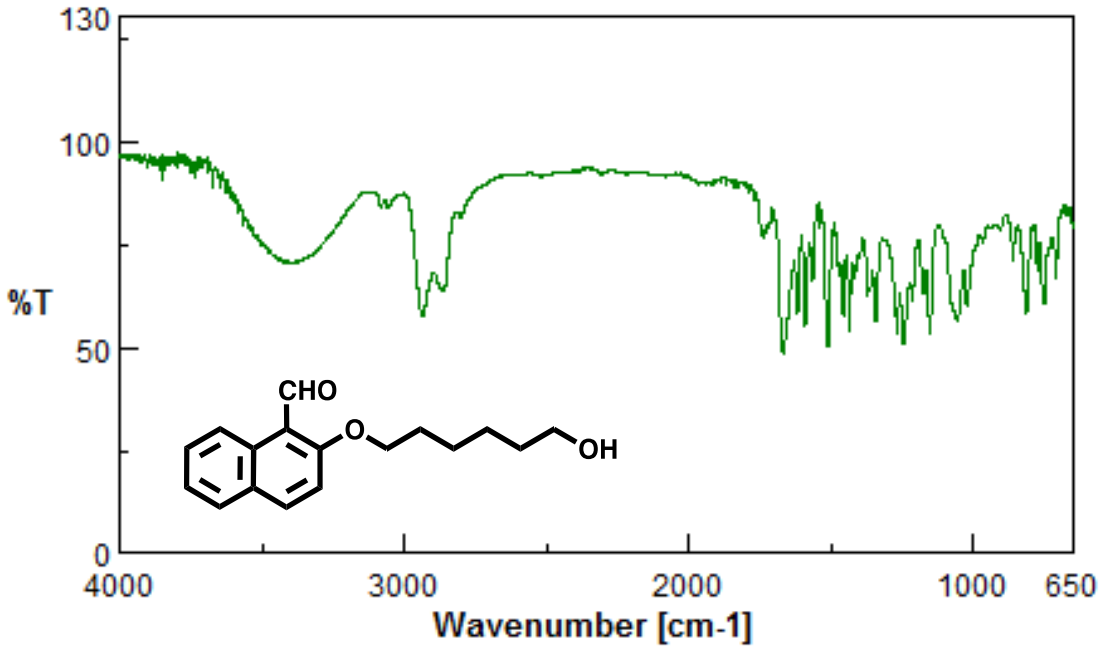
IR spectrum of **A** (NaCl).



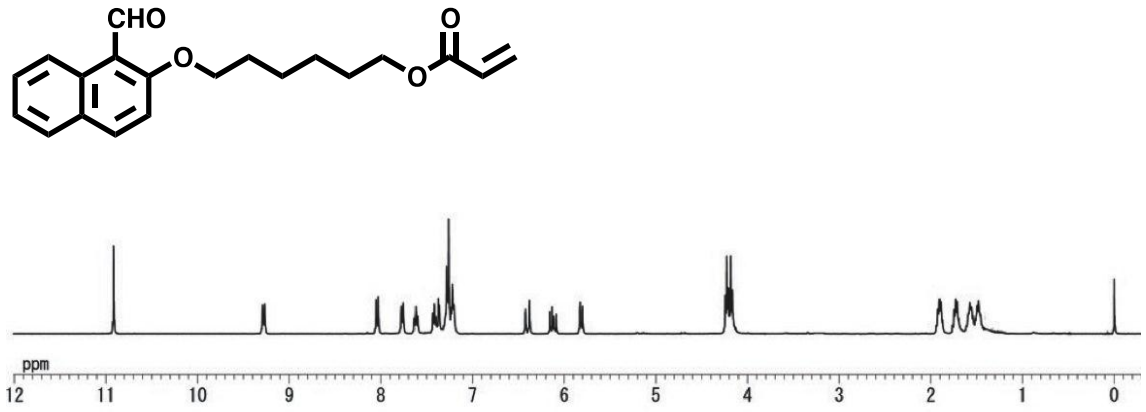
^{1}H NMR spectrum of **B** (400 MHz, $CDCl_3$, 298 K).



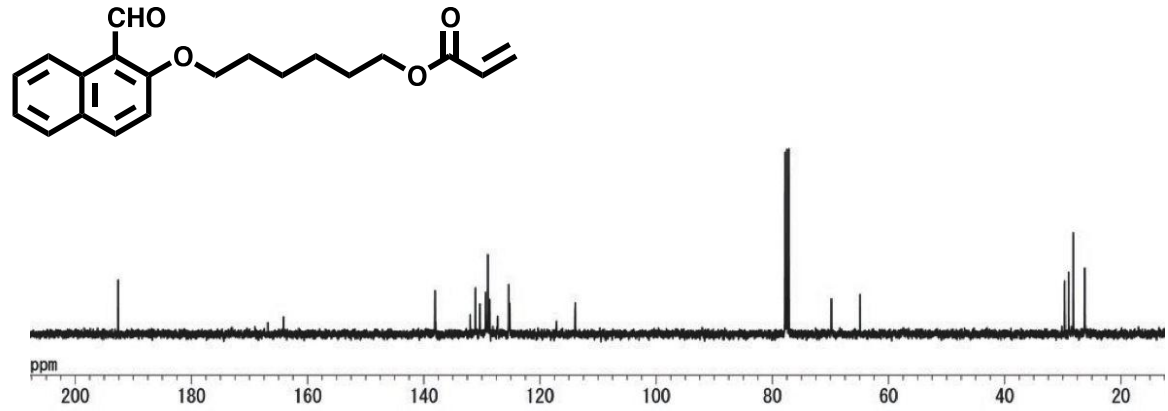
^{13}C NMR spectrum of **B** (100 MHz, $CDCl_3$, 298 K).



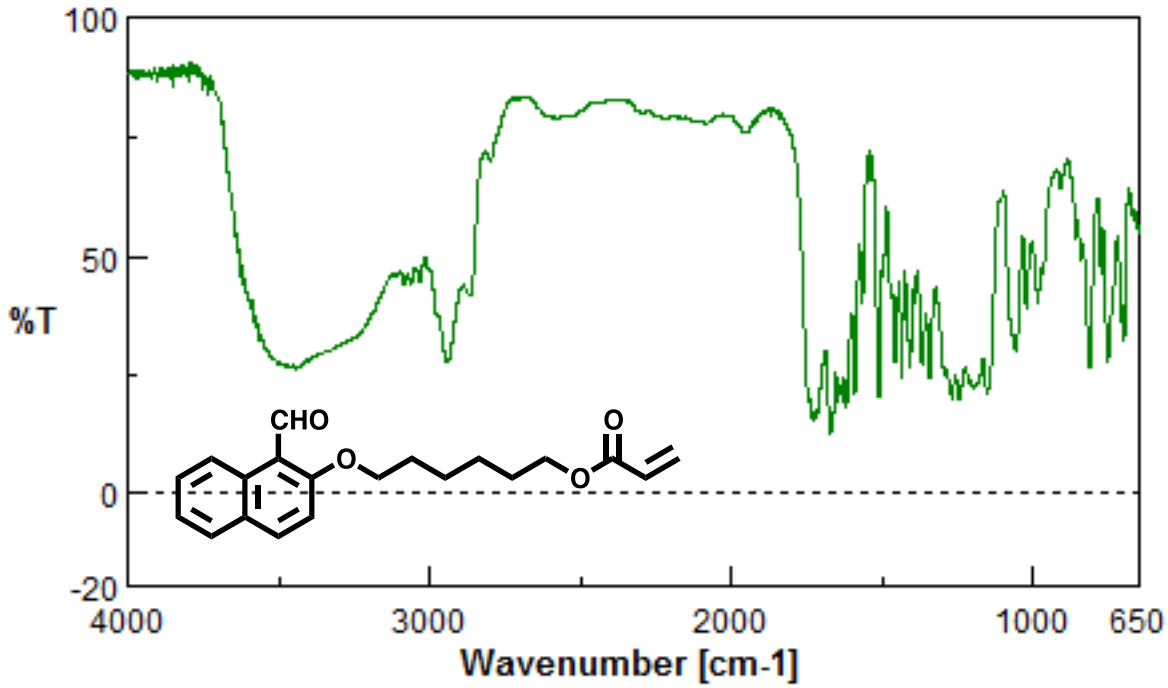
IR spectrum of **B** (NaCl).



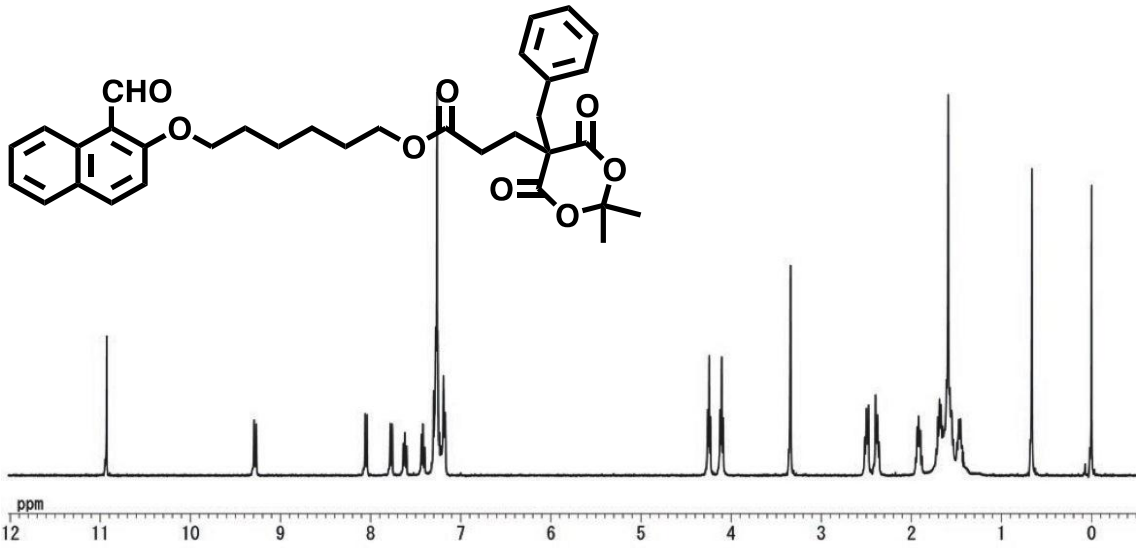
^{1}H NMR spectrum of **C** (400 MHz, $CDCl_3$, 298 K).



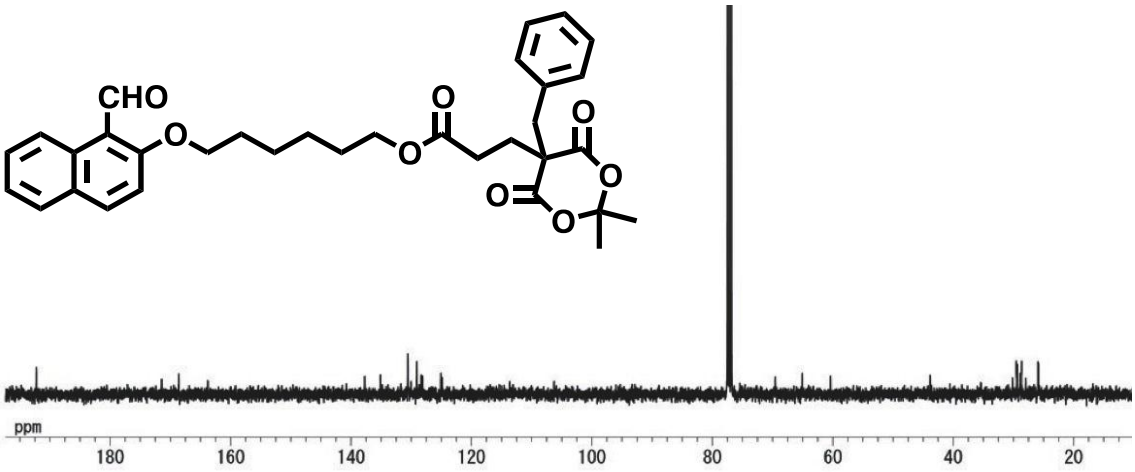
^{13}C NMR spectrum of **C** (100 MHz, $CDCl_3$, 298 K).



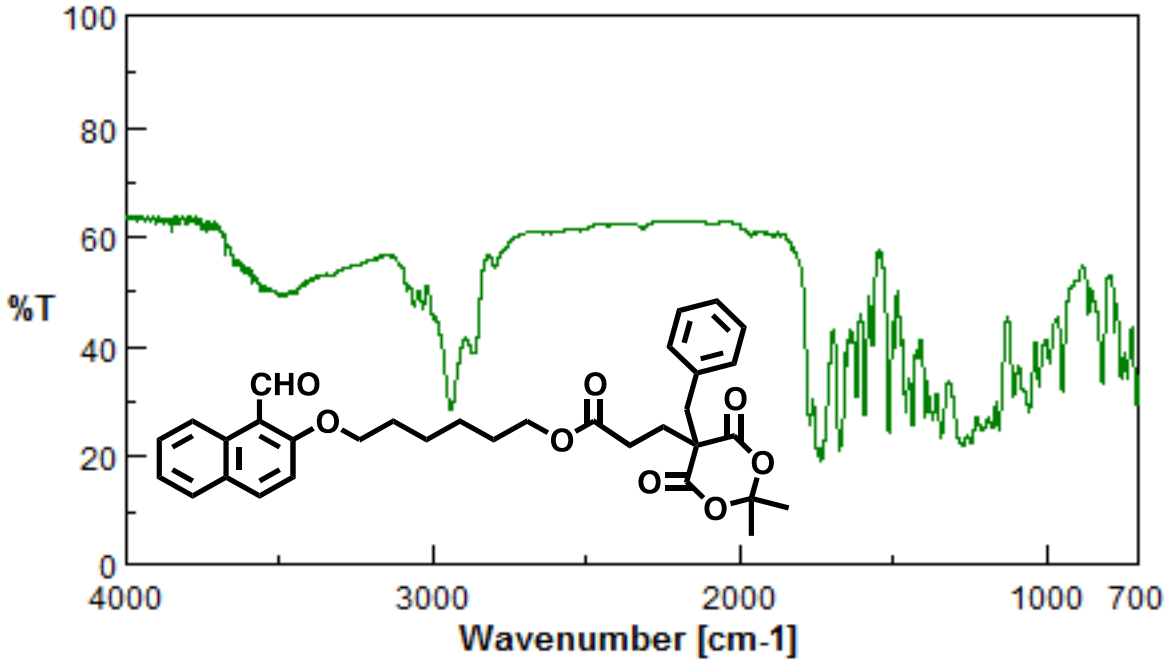
IR spectrum of **C** (NaCl).



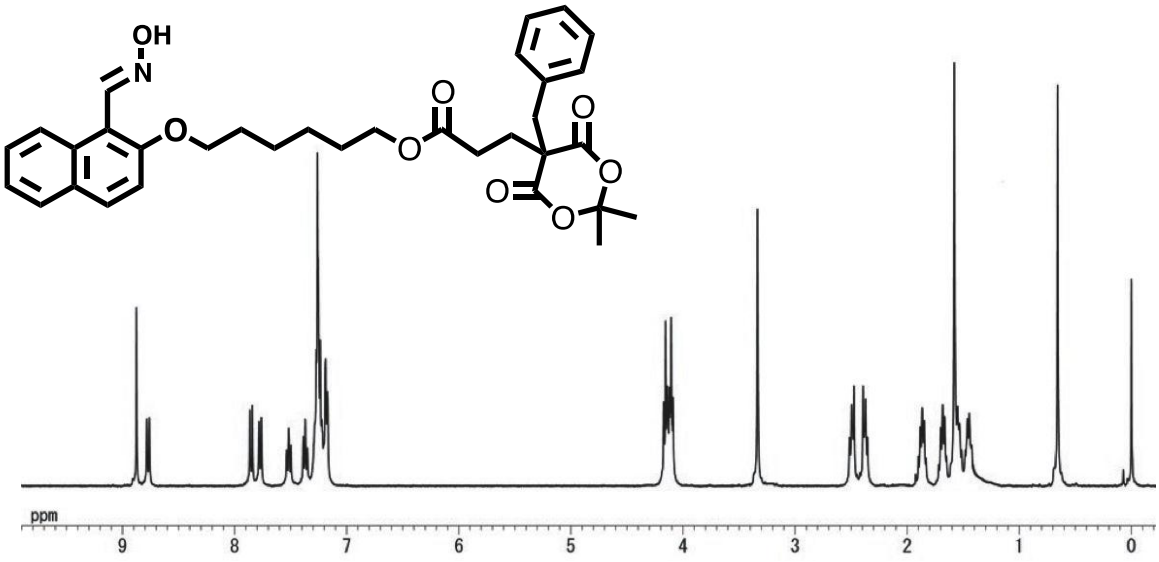
^{1}H NMR spectrum of **D** (400 MHz, $CDCl_3$, 298 K).



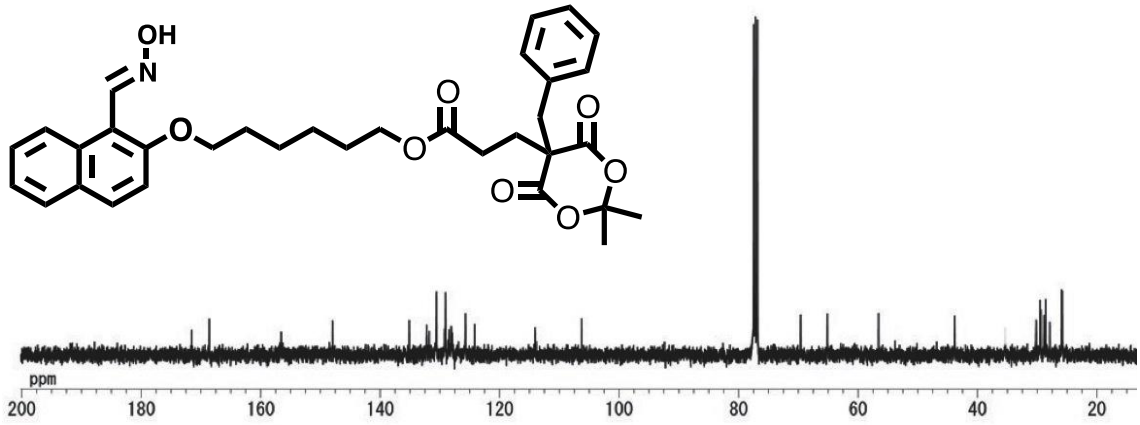
^{13}C NMR spectrum of **D** (100 MHz, $CDCl_3$, 298 K).



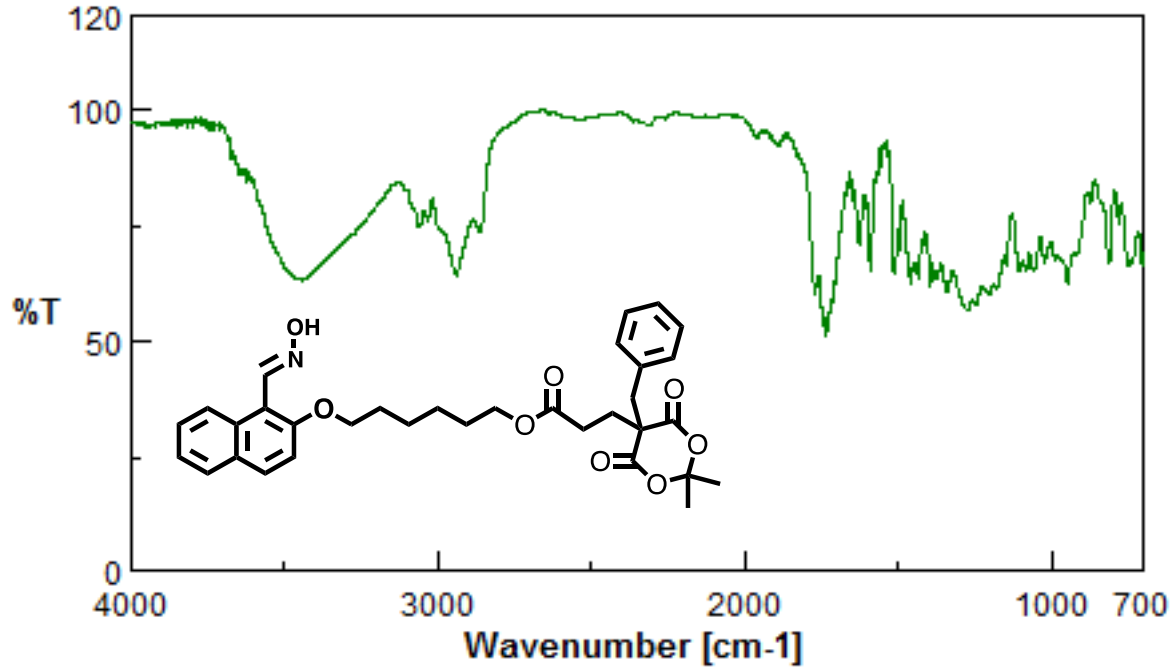
IR spectrum of **D** (NaCl).



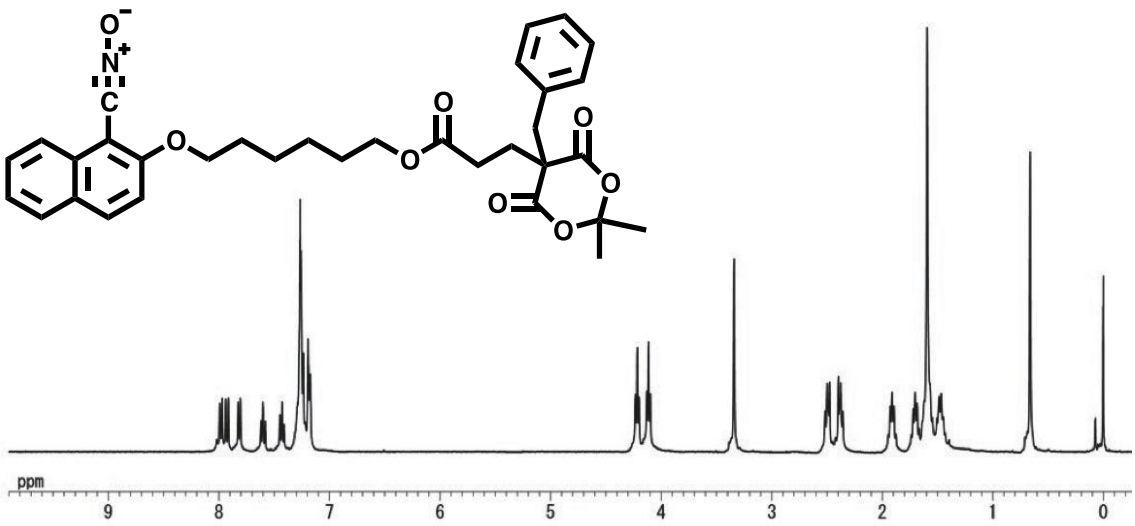
^{1}H NMR spectrum of **E** (400 MHz, $CDCl_3$, 298 K).



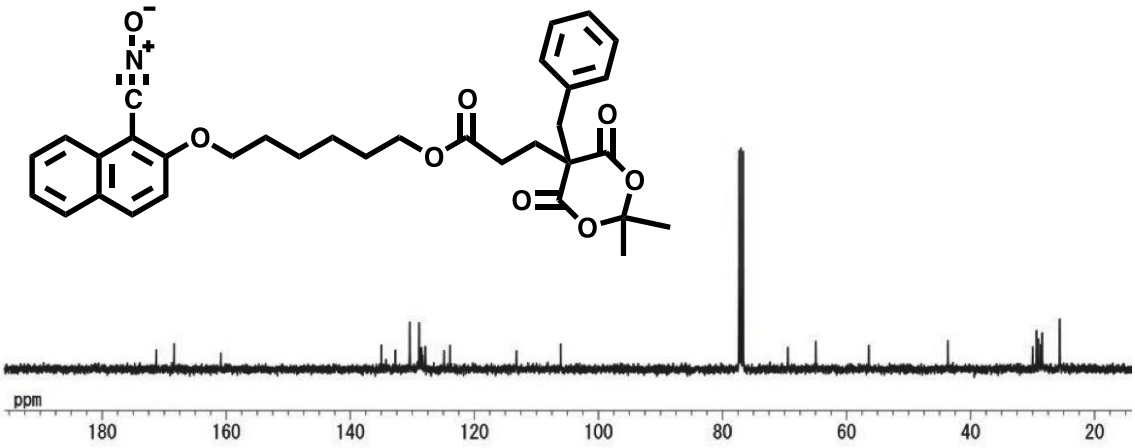
^{13}C NMR spectrum of **E** (100 MHz, $CDCl_3$, 298 K).



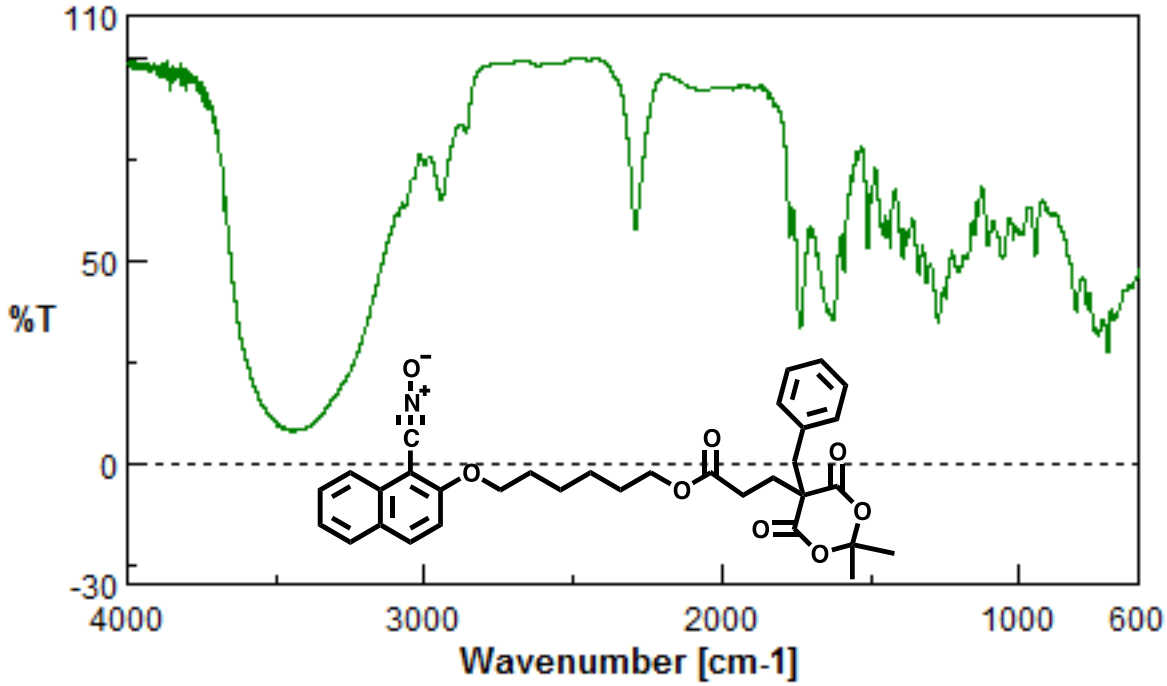
IR spectrum of **E** (NaCl).



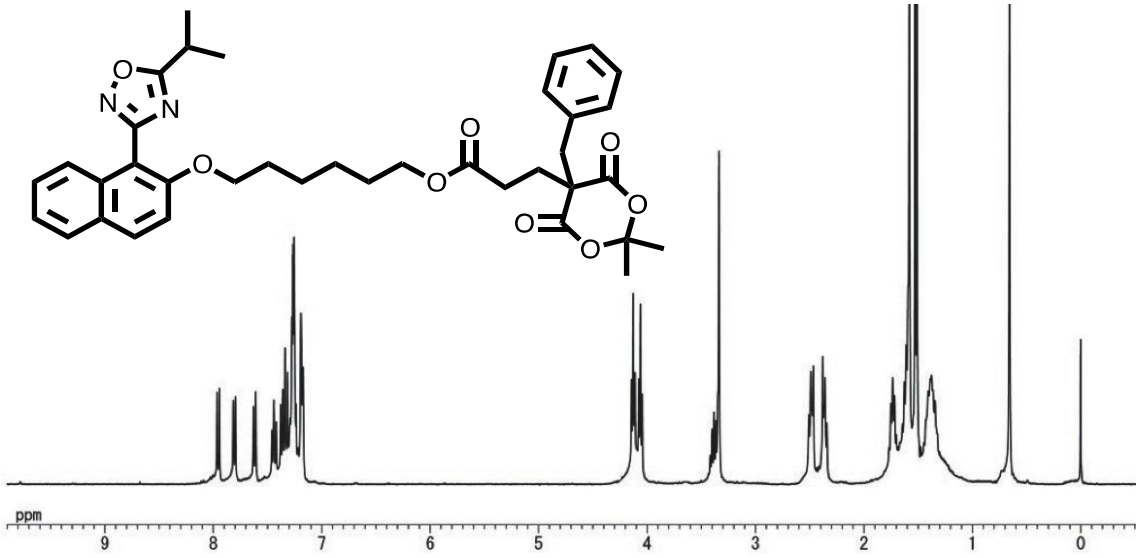
^{1}H NMR spectrum of **1** (400 MHz, $CDCl_3$, 298 K).



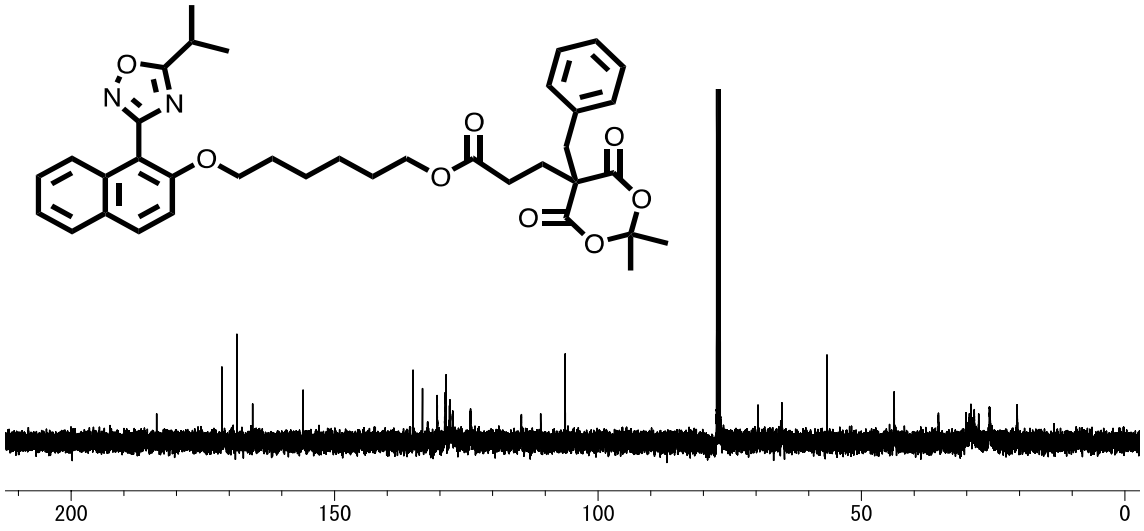
^{13}C NMR spectrum of **1** (100 MHz, $CDCl_3$, 298 K).



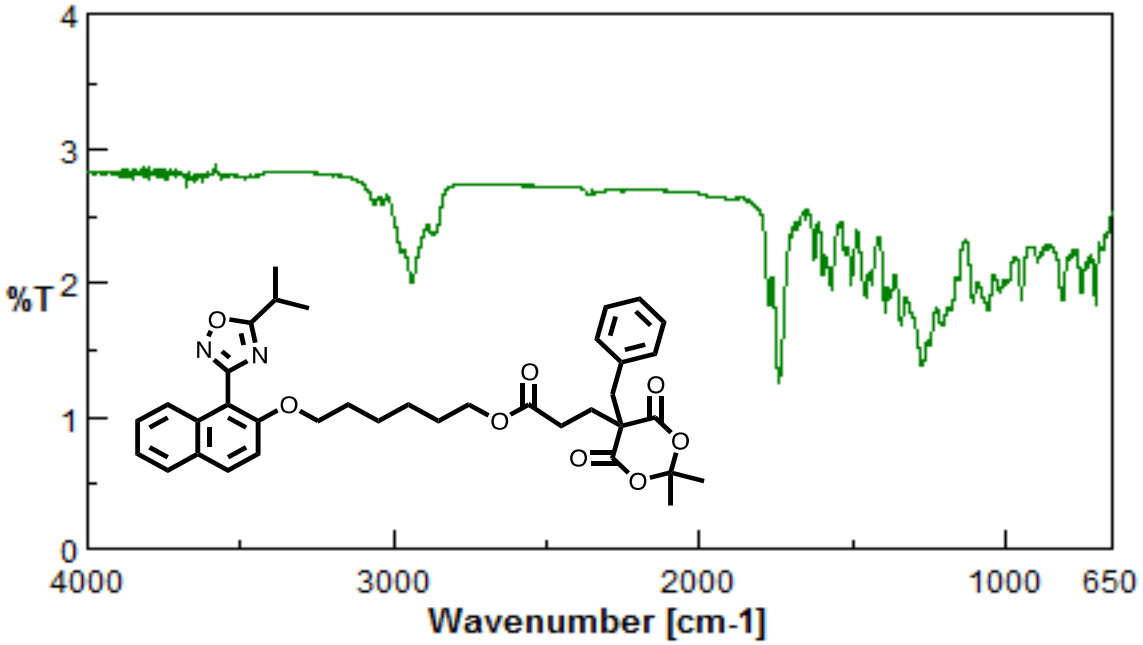
IR spectrum of **1** (NaCl).



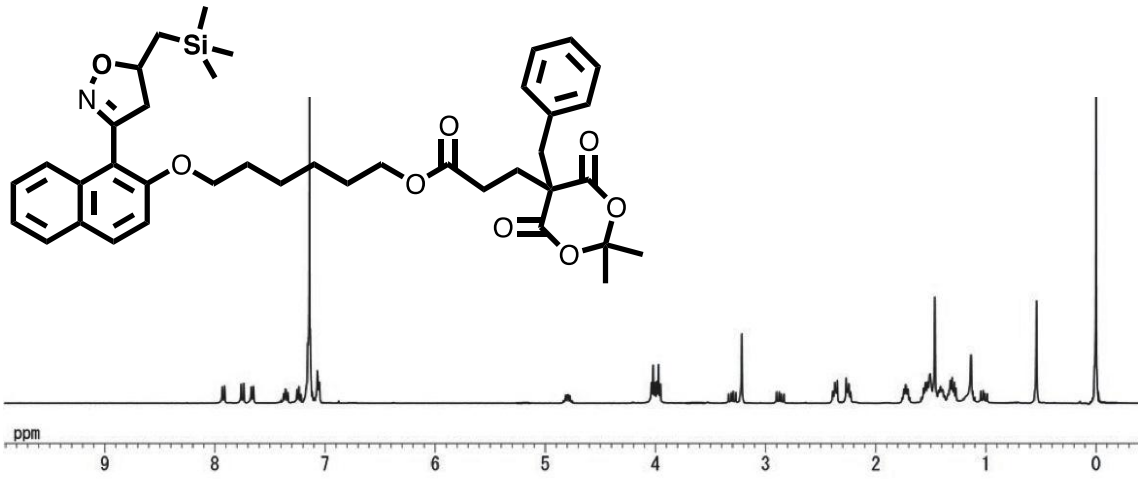
^{1}H NMR spectrum of **2** (400 MHz, $CDCl_3$, 298 K).



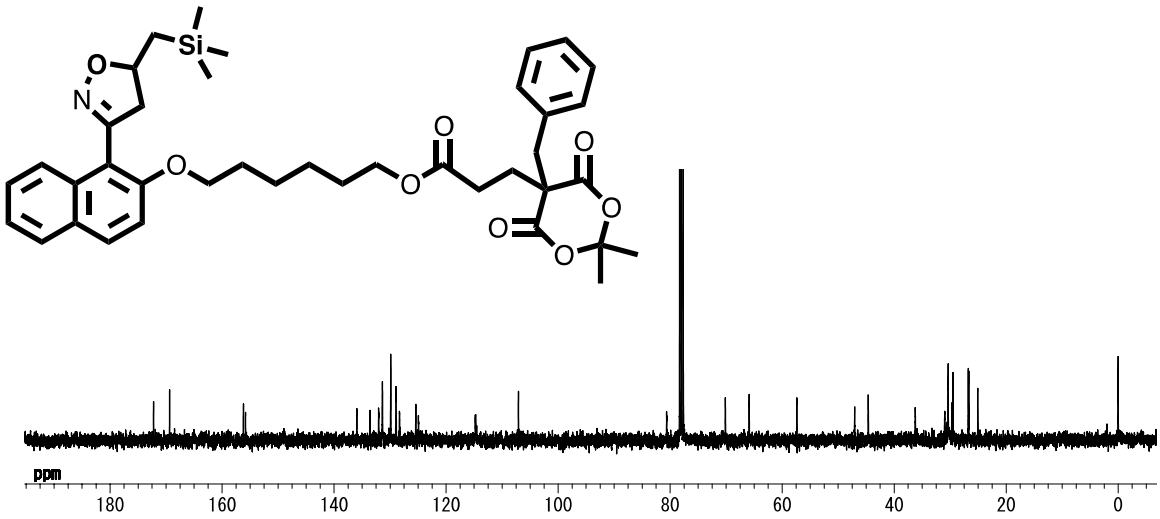
^{13}C NMR spectrum of **2** (100 MHz, $CDCl_3$, 298 K).



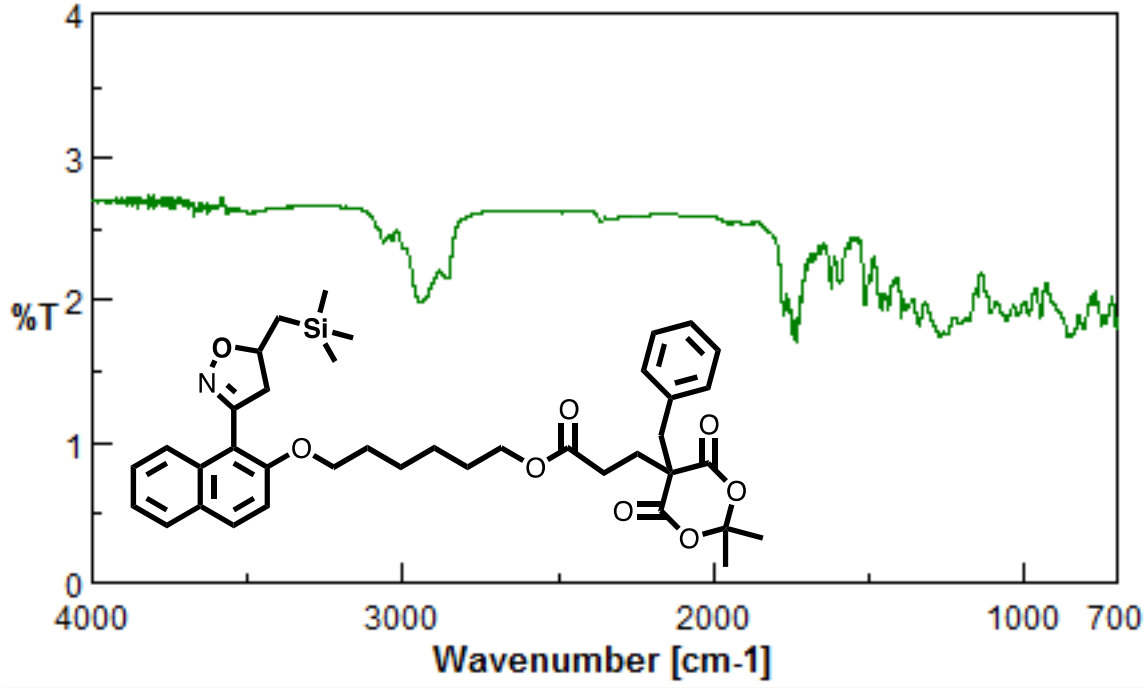
IR spectrum of **2** (NaCl).



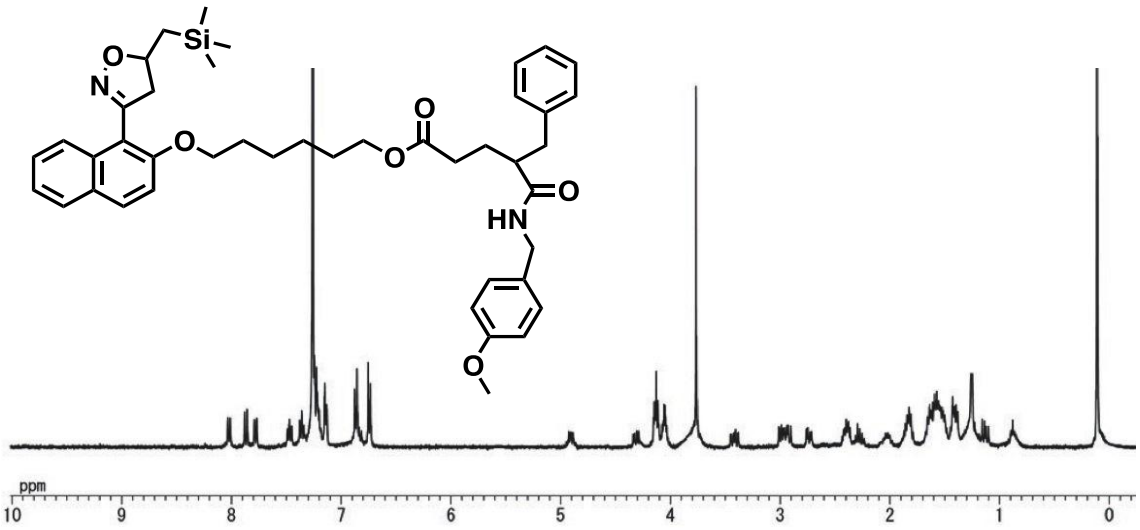
^{1}H NMR spectrum of **3** (400 MHz, $CDCl_3$, 298 K).



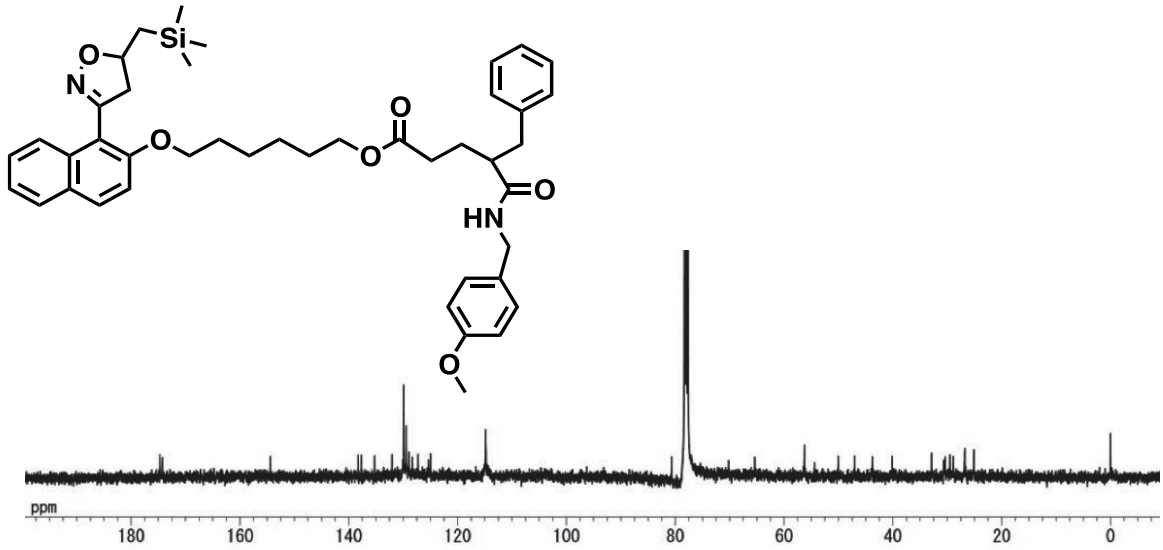
^{13}C NMR spectrum of **3** (100 MHz, $CDCl_3$, 298 K).



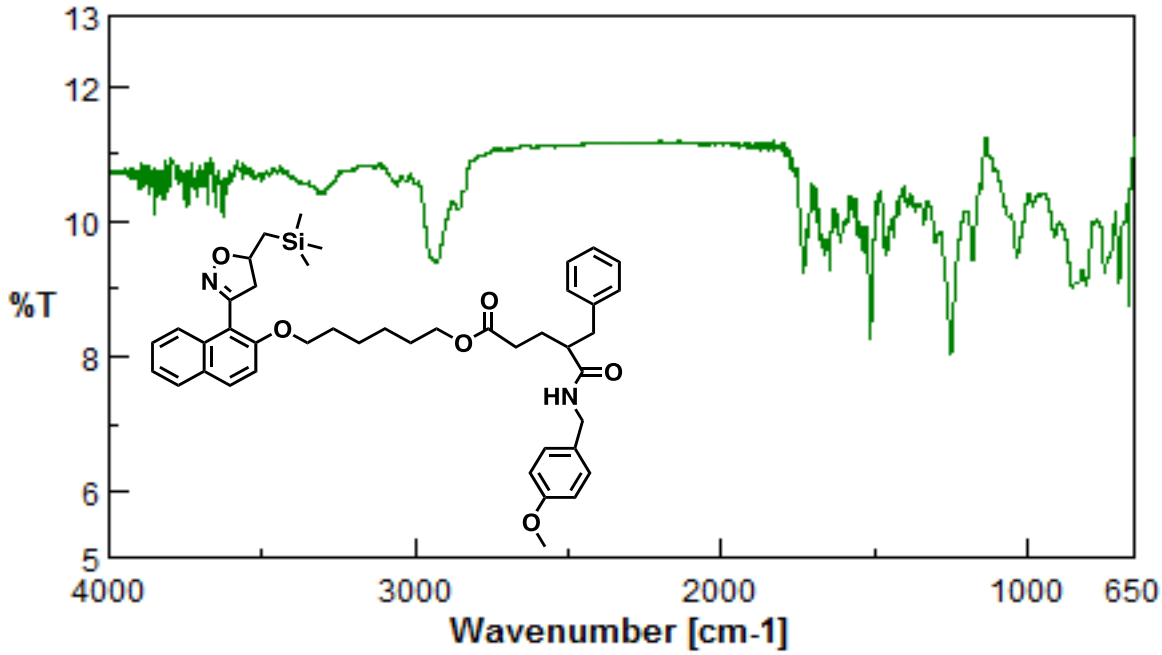
IR spectrum of **3** (NaCl).



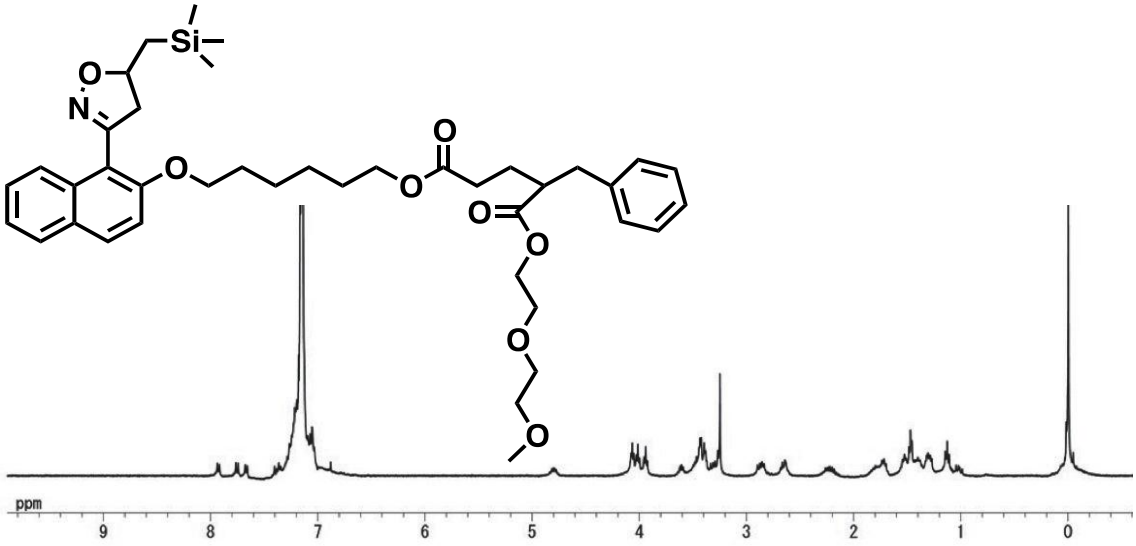
^{1}H NMR spectrum of **4** (400 MHz, $CDCl_3$, 298 K).



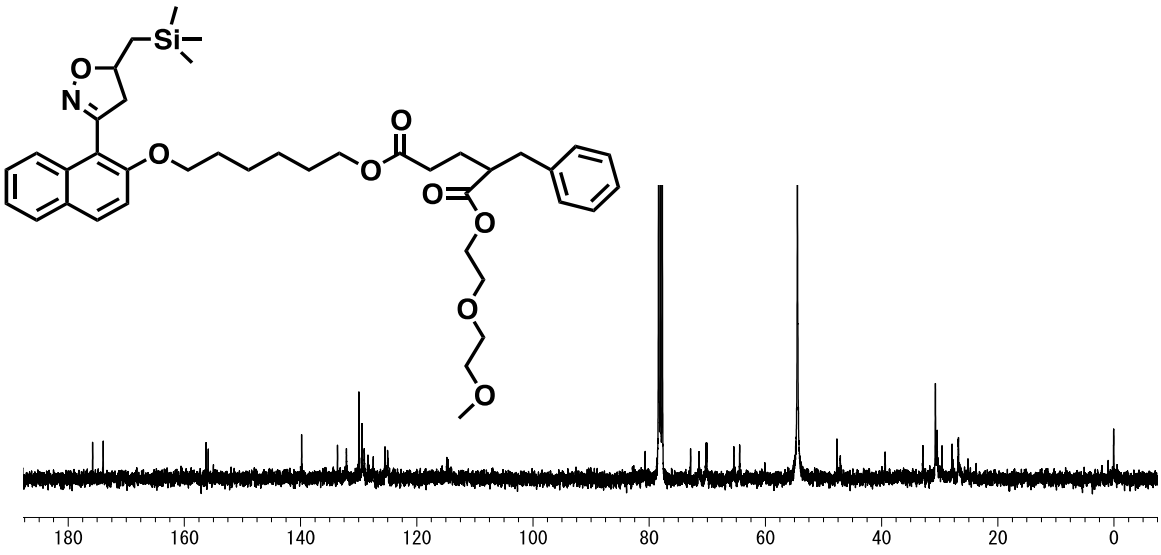
^{13}C NMR spectrum of **4** (100 MHz, $CDCl_3$, 298 K).



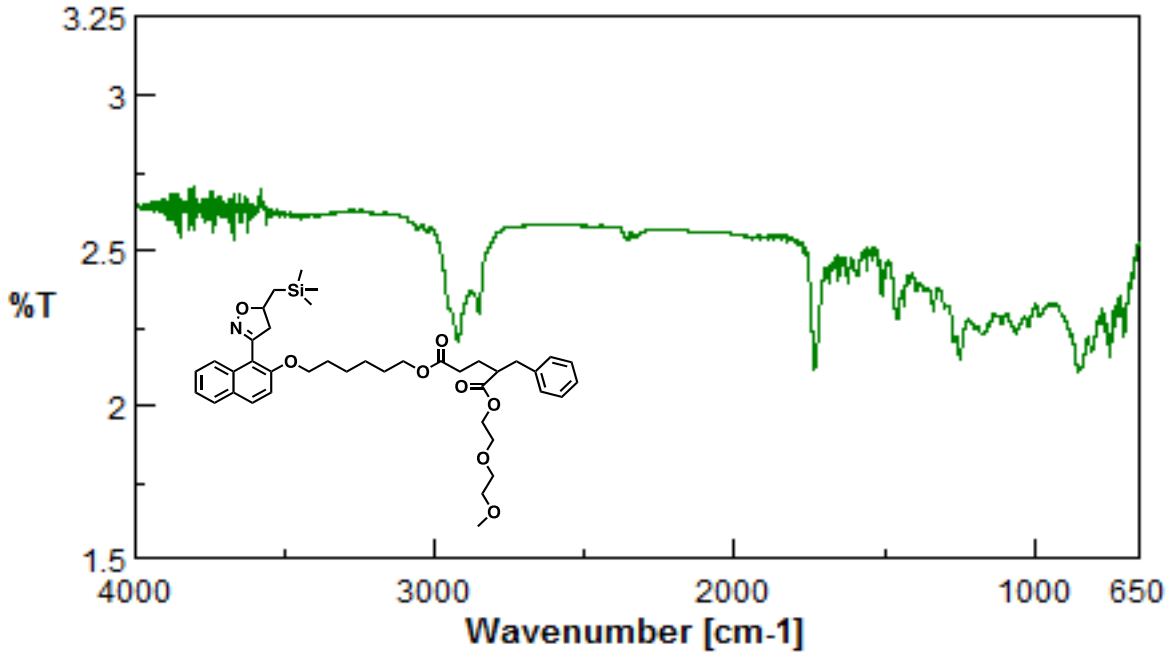
IR spectrum of **4** (NaCl).



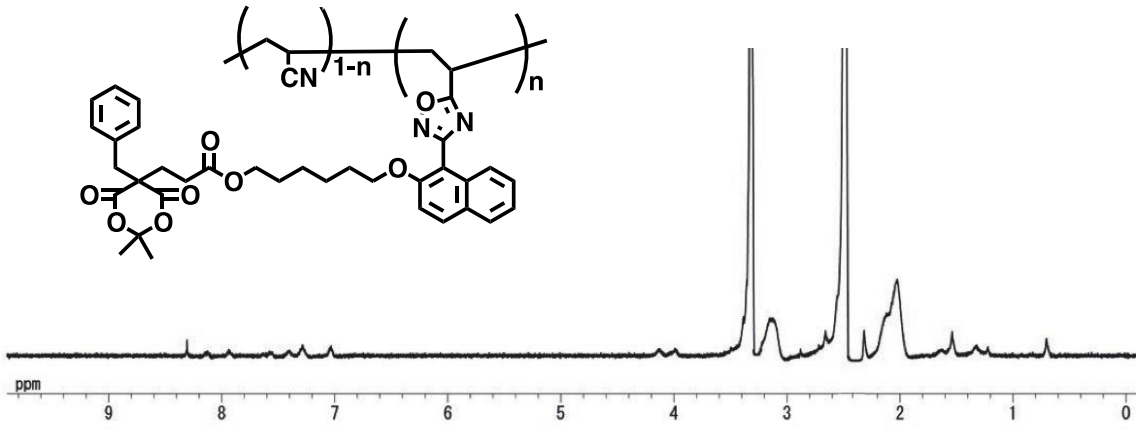
^{1}H NMR spectrum of **5** (400 MHz, $CDCl_3$, 298 K).



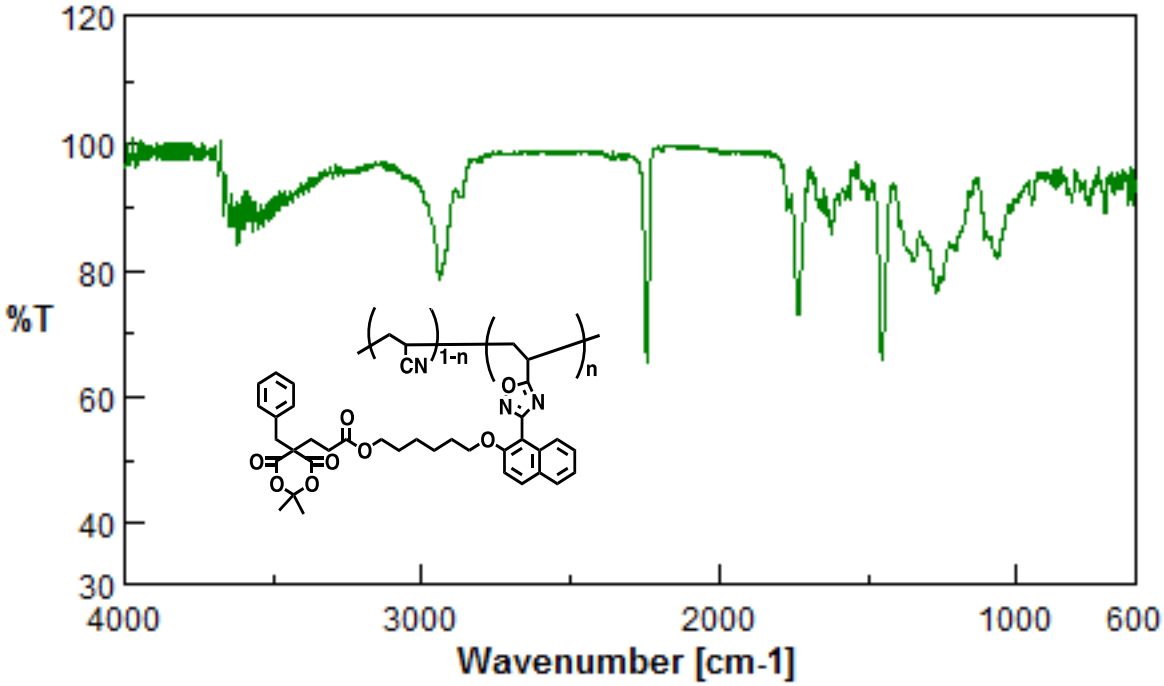
^{13}C NMR spectrum of **5** (100 MHz, $CDCl_3$, 298 K).



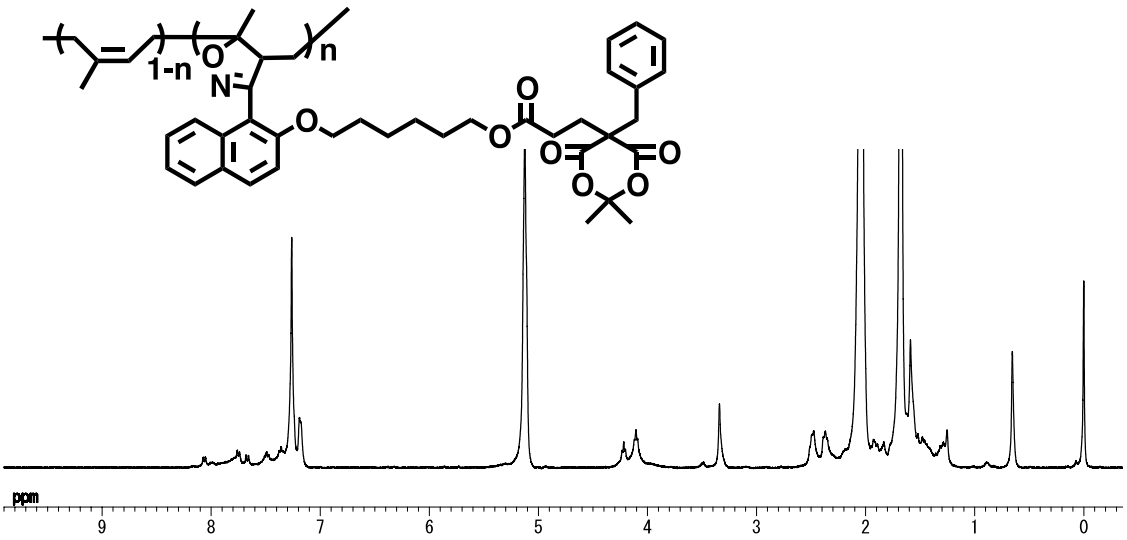
IR spectrum of **5** (NaCl).



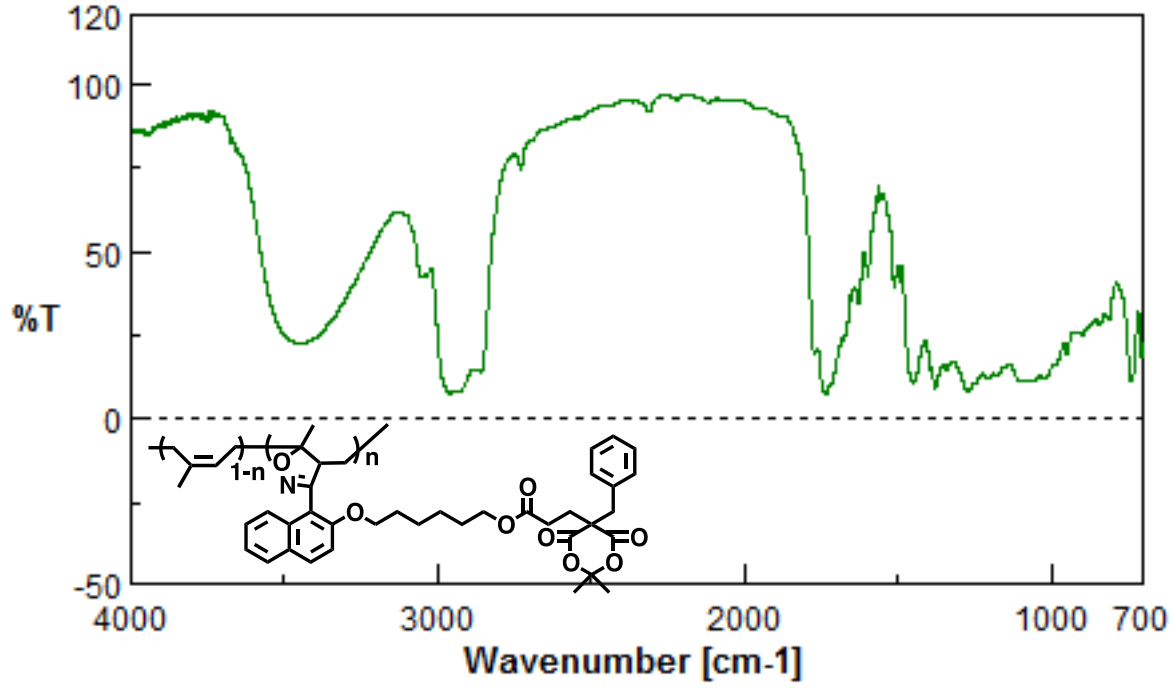
^{1}H NMR spectrum of **functionalized PAN** (400 MHz, DMSO, 298 K).



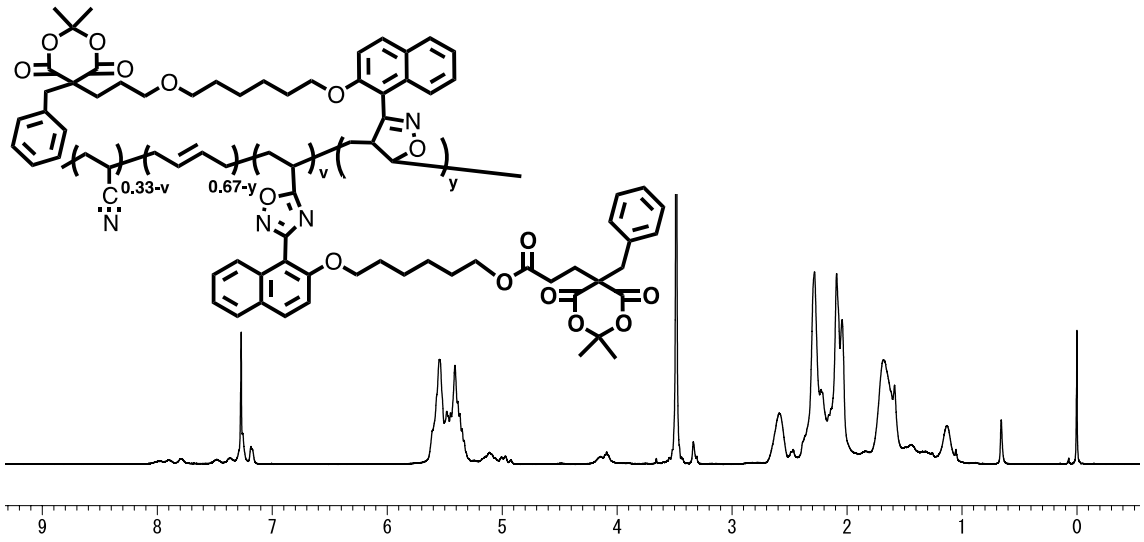
IR spectrum of **functionalized PAN** (KBr).



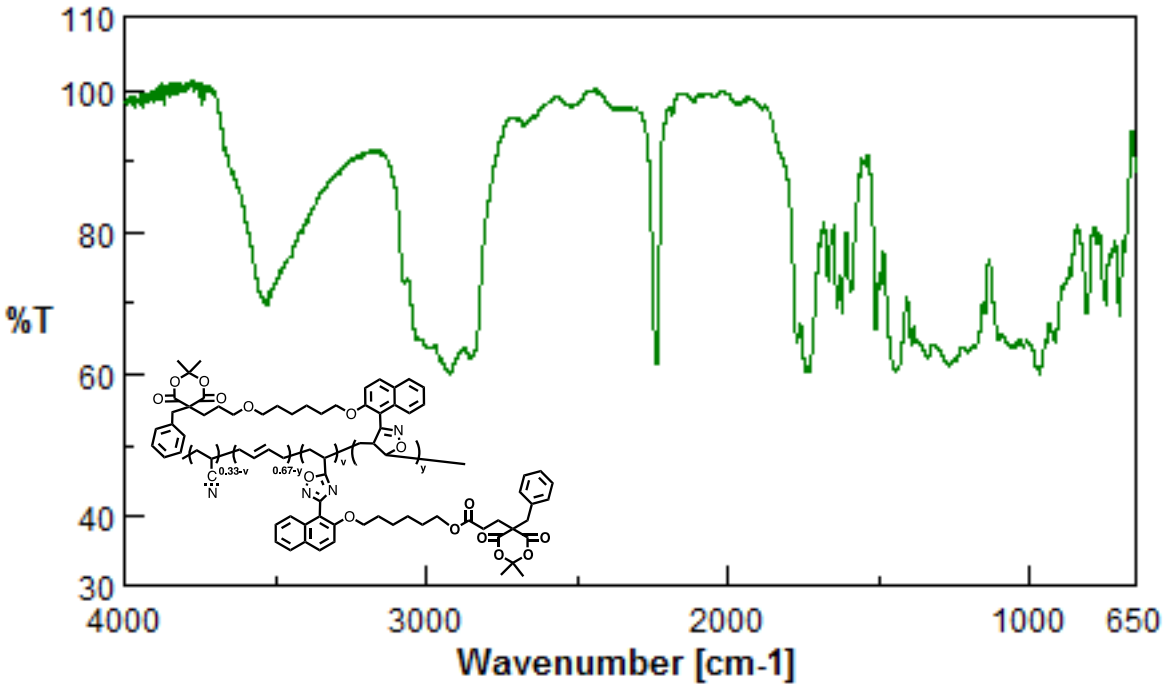
^{1}H NMR spectrum of **functionalized NR** (400 MHz, $CDCl_3$, 298 K).



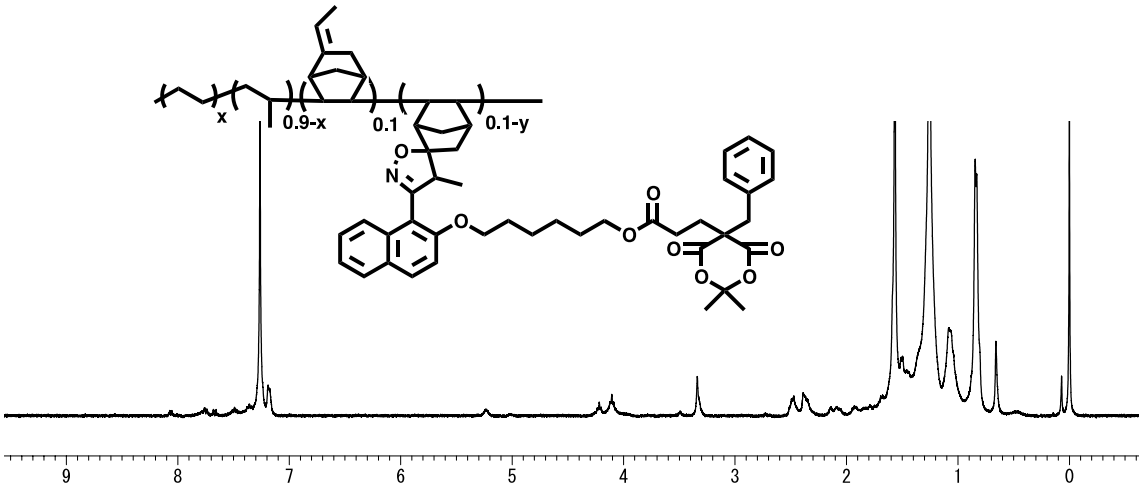
IR spectrum of **functionalized NR** (NaCl).



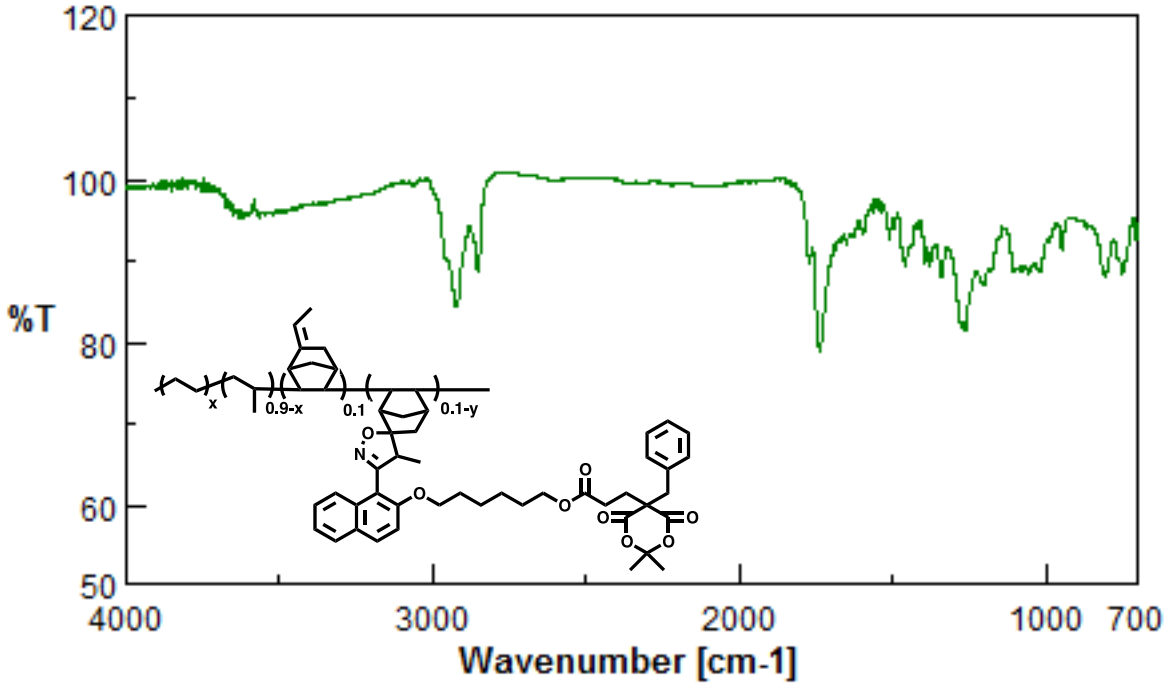
^{1}H NMR spectrum of **functionalized NBR** (400 MHz, $CDCl_3$, 298 K).



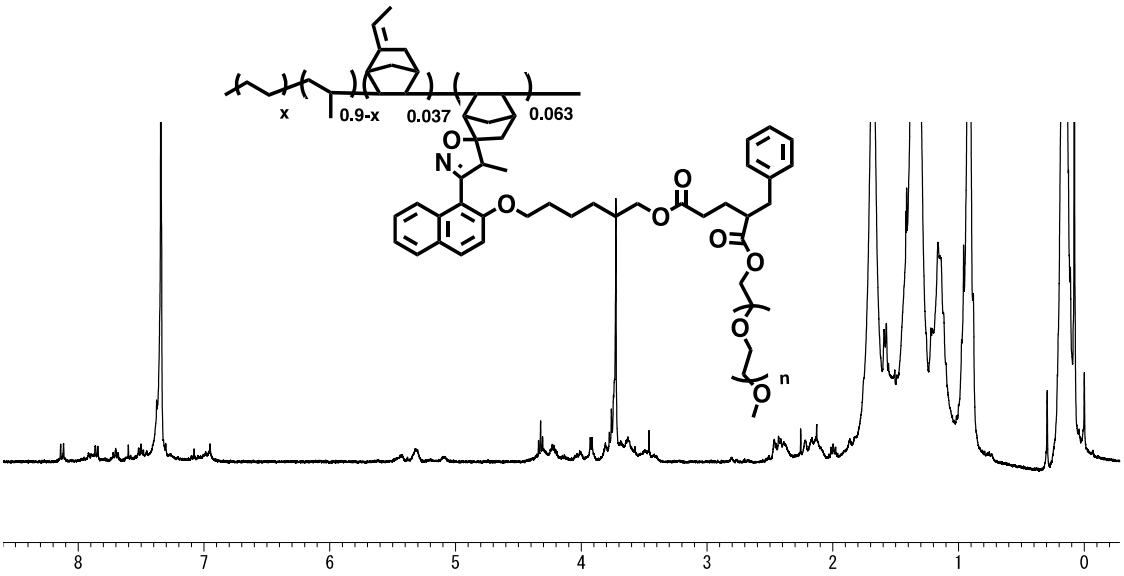
IR spectrum of **functionalized NBR** (NaCl).



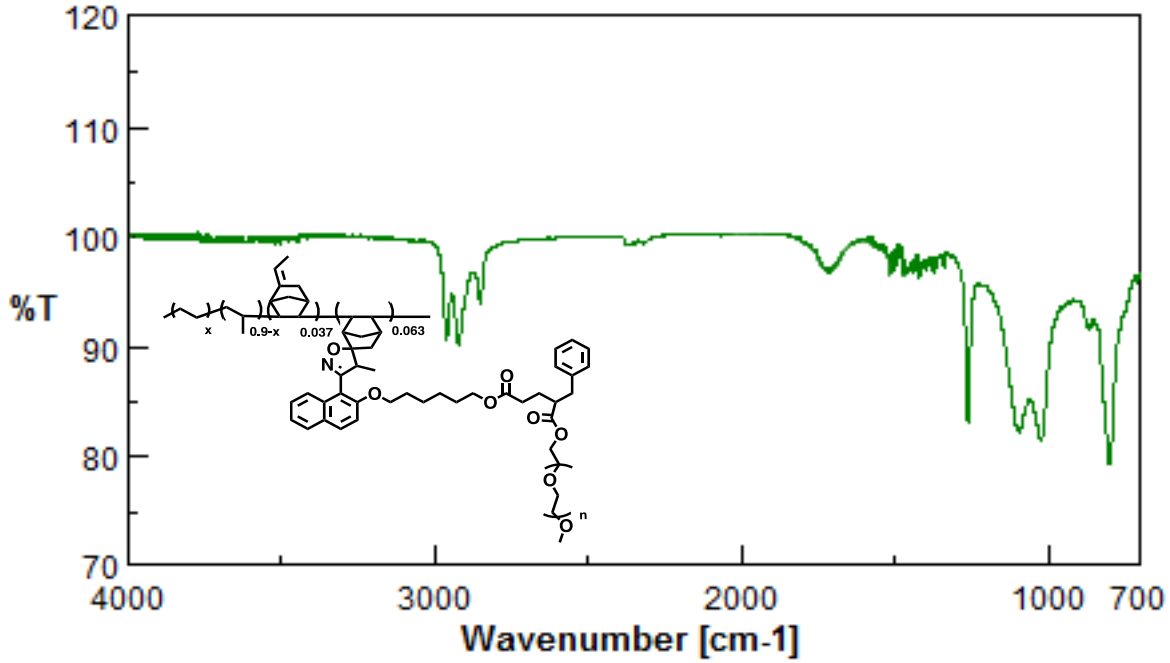
^{1}H NMR spectrum of **functionalized EPDM** (400 MHz, $CDCl_3$, 298 K).



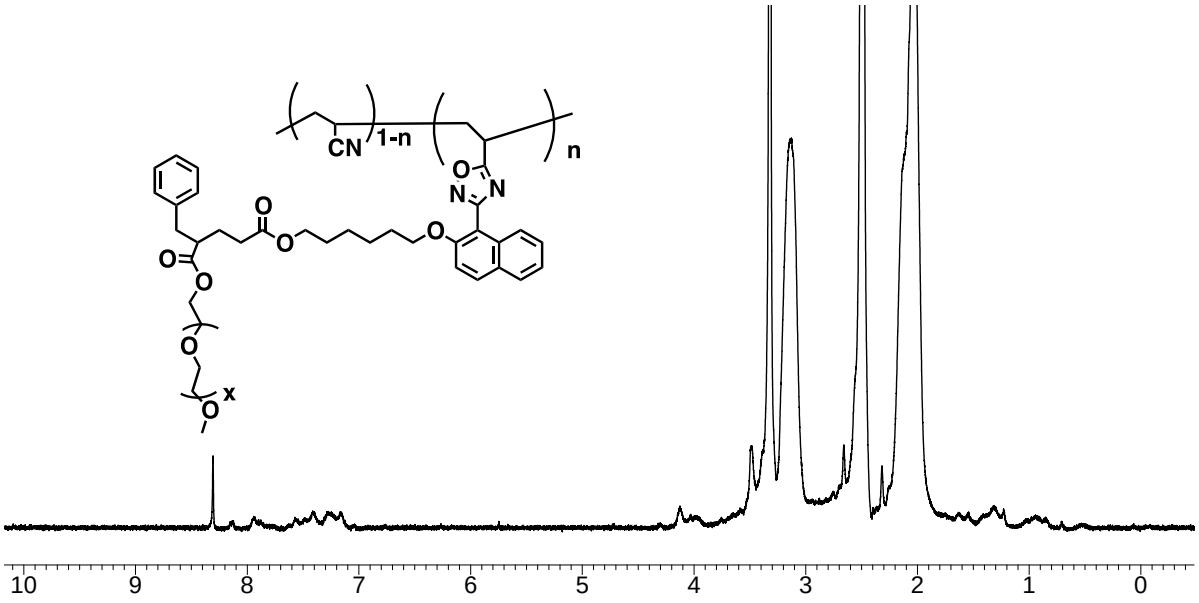
IR spectrum of **functionalized EPDM** (NaCl).



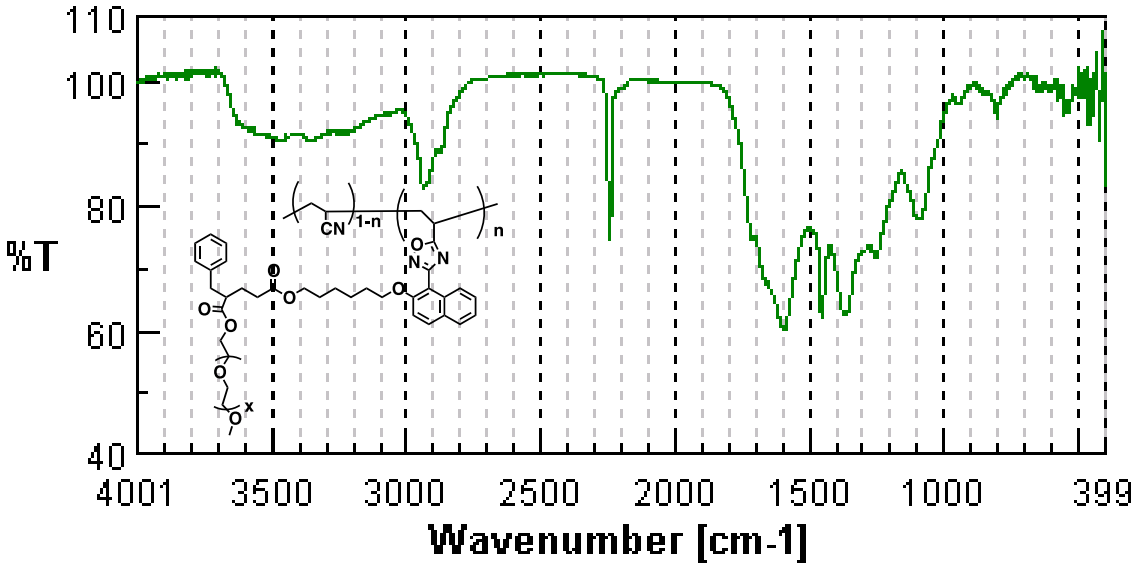
^{1}H NMR spectrum of **PEG-Graft EPDM** (400 MHz, $CDCl_3$, 298 K).



IR spectrum of **PEG-Graft EPDM** (NaCl).

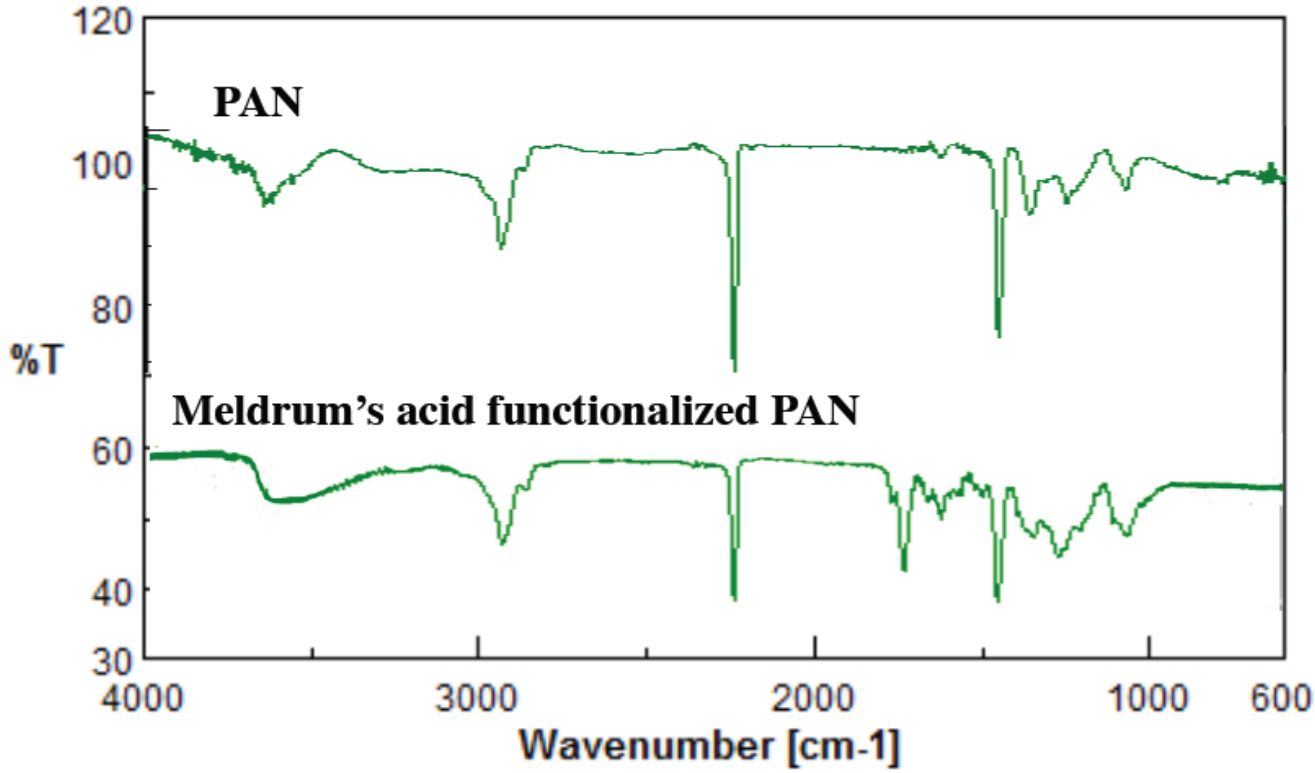


^{1}H NMR spectrum of **PEG-Graft PAN** (400 MHz, DMSO, 298 K).

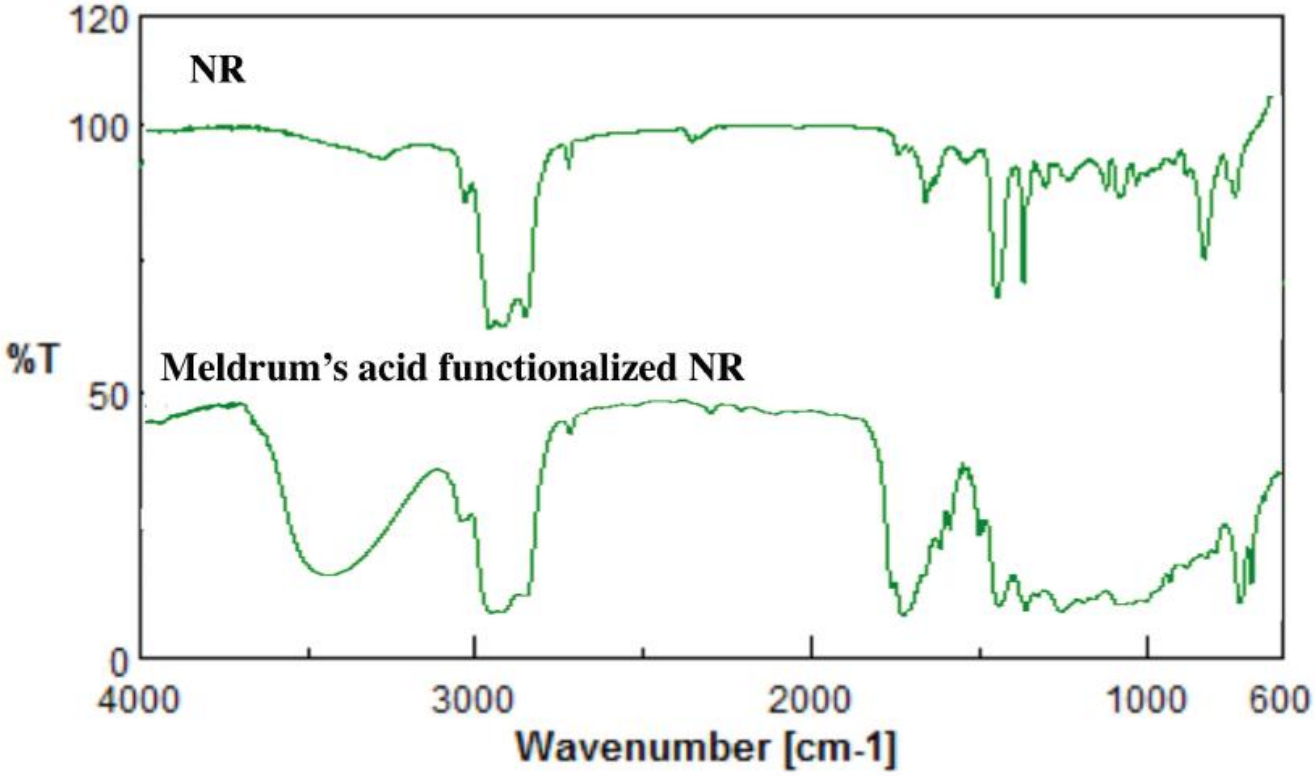


IR spectrum of **PEG-Graft PAN** (NaCl).

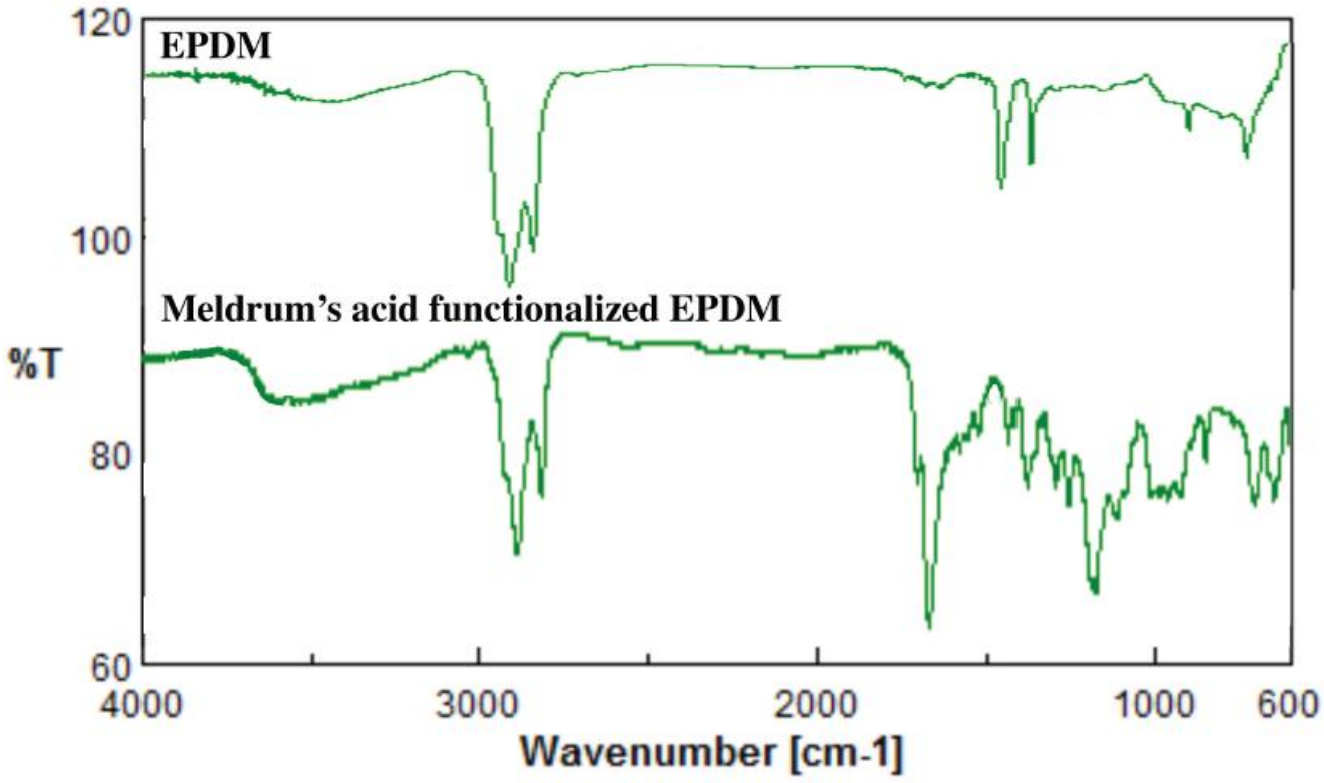
Comparison of IR spectra between before and after functionalization or cross-linking reaction



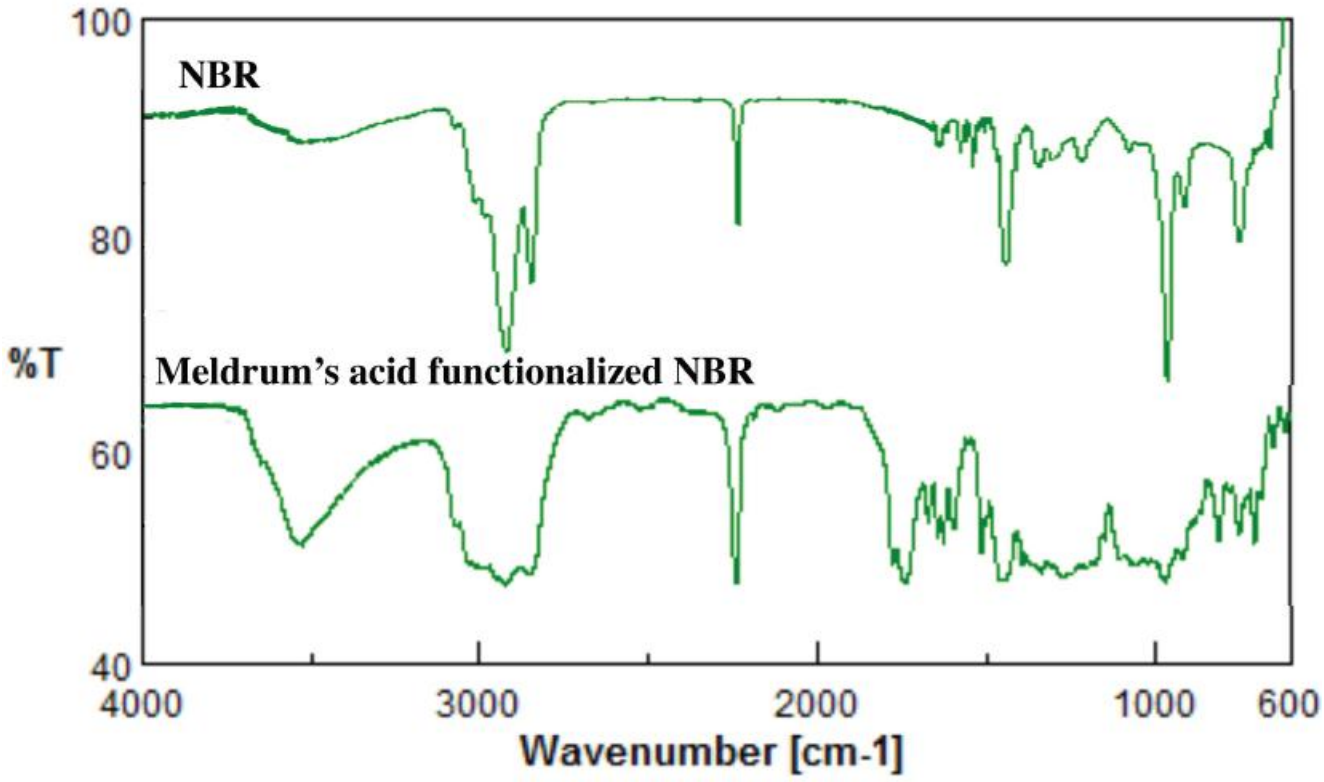
IR spectra of PAN and Meldrum's acid-functionalized PAN (NaCl).



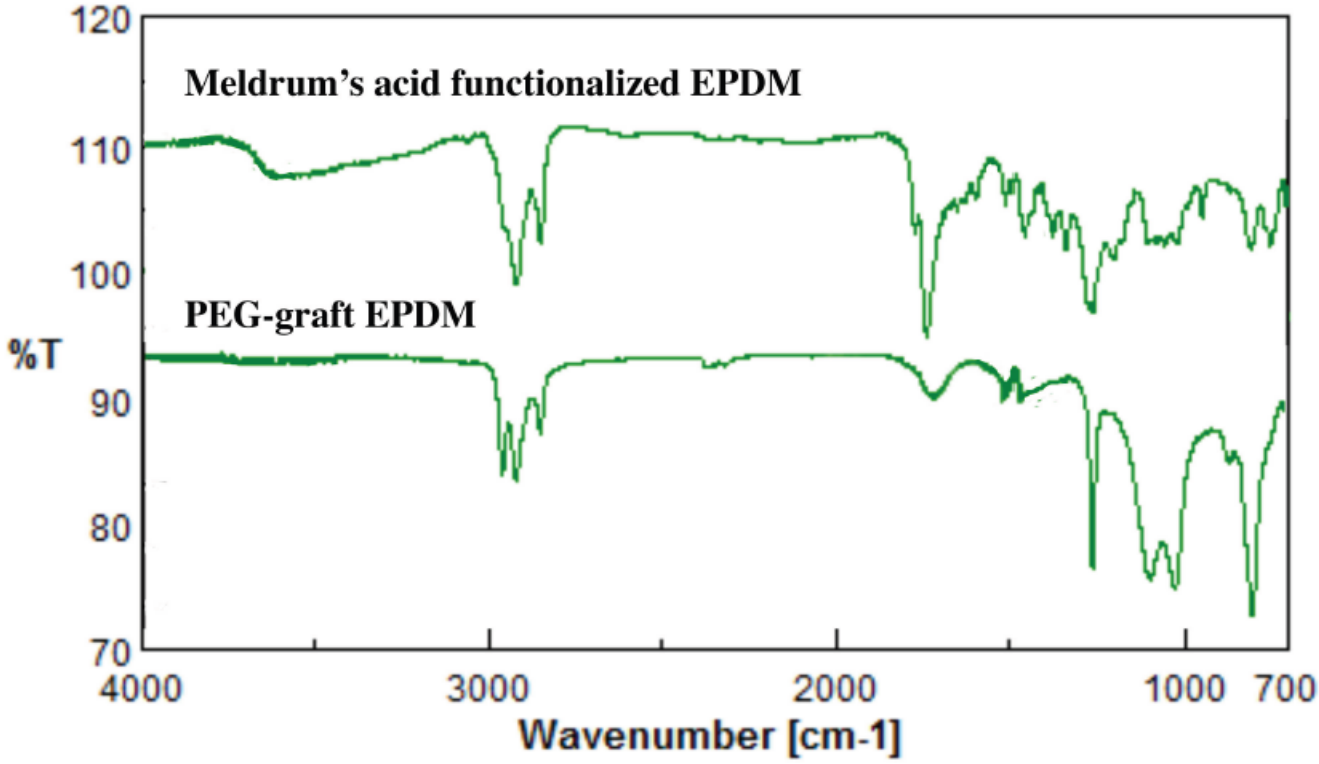
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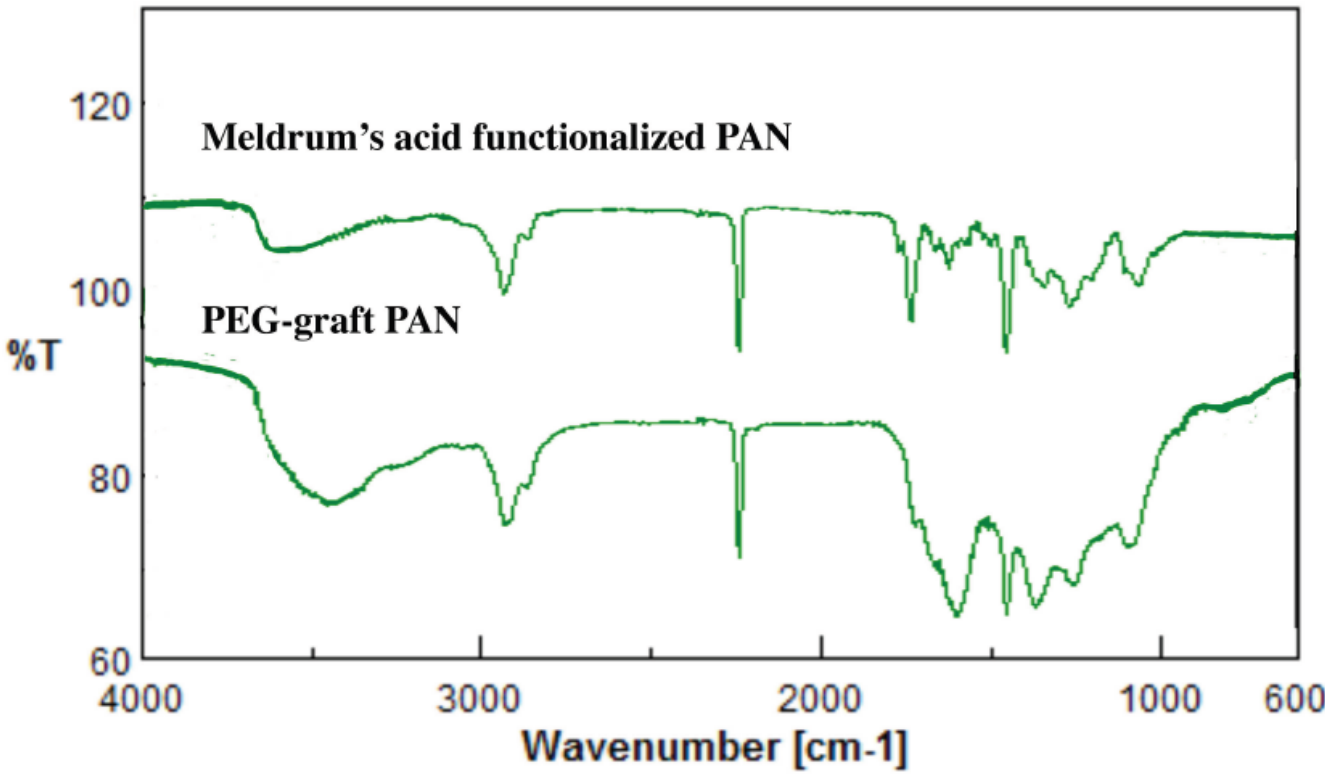
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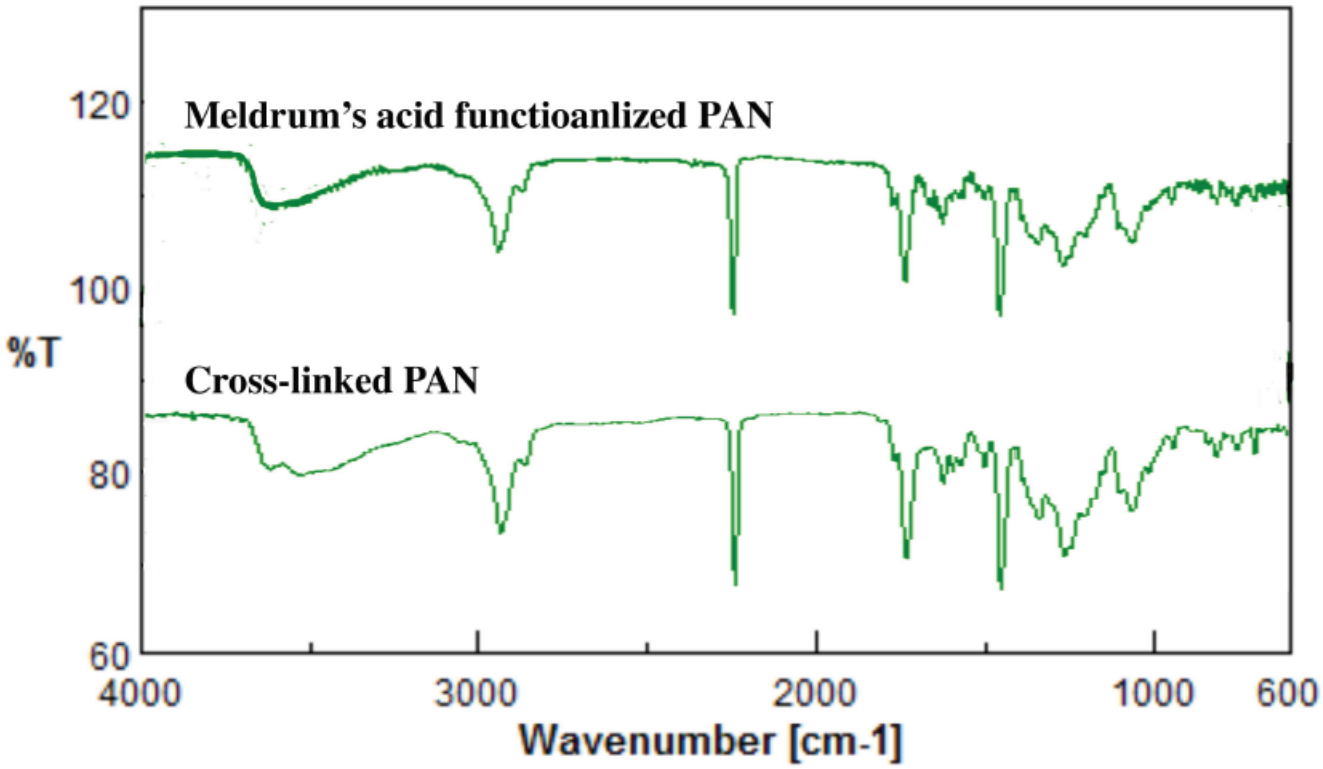
IR spectra of NBR and Meldrum's acid-functionalized NBR (NaCl).



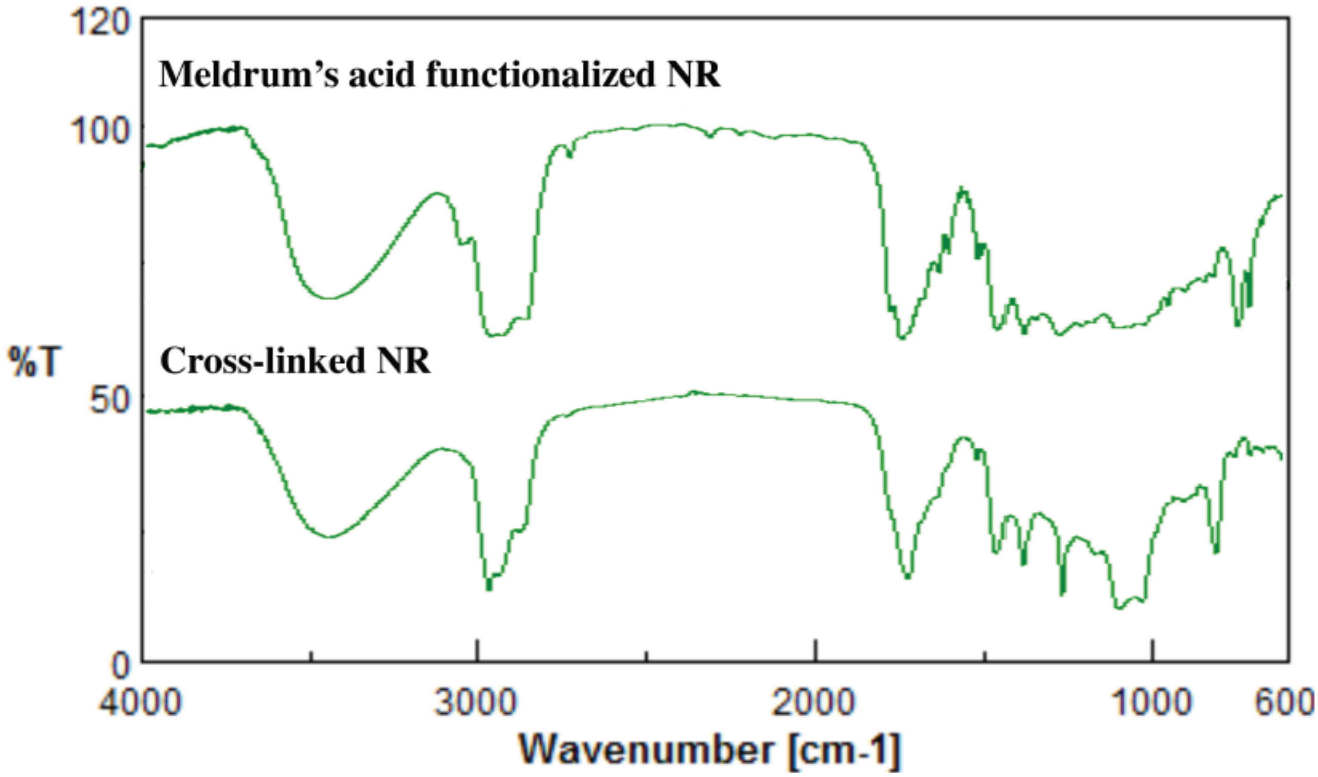
IR spectra of Meldrum's acid-functionalized EPDM and PEG-grafted EPDM (NaCl).



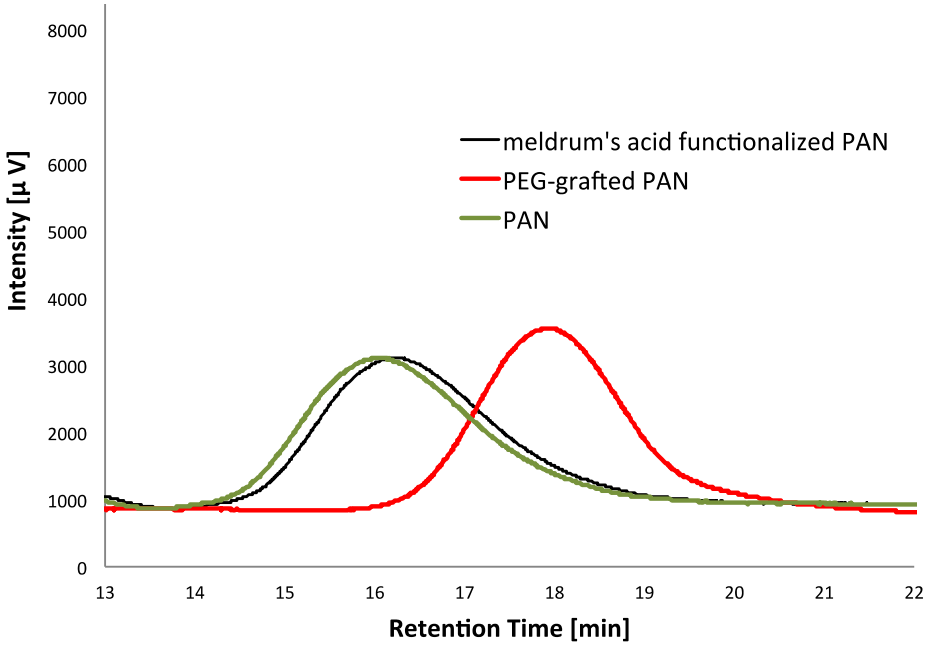
IR spectra of Meldrum's acid-functionalized PAN and PEG-grafted PAN (NaCl).



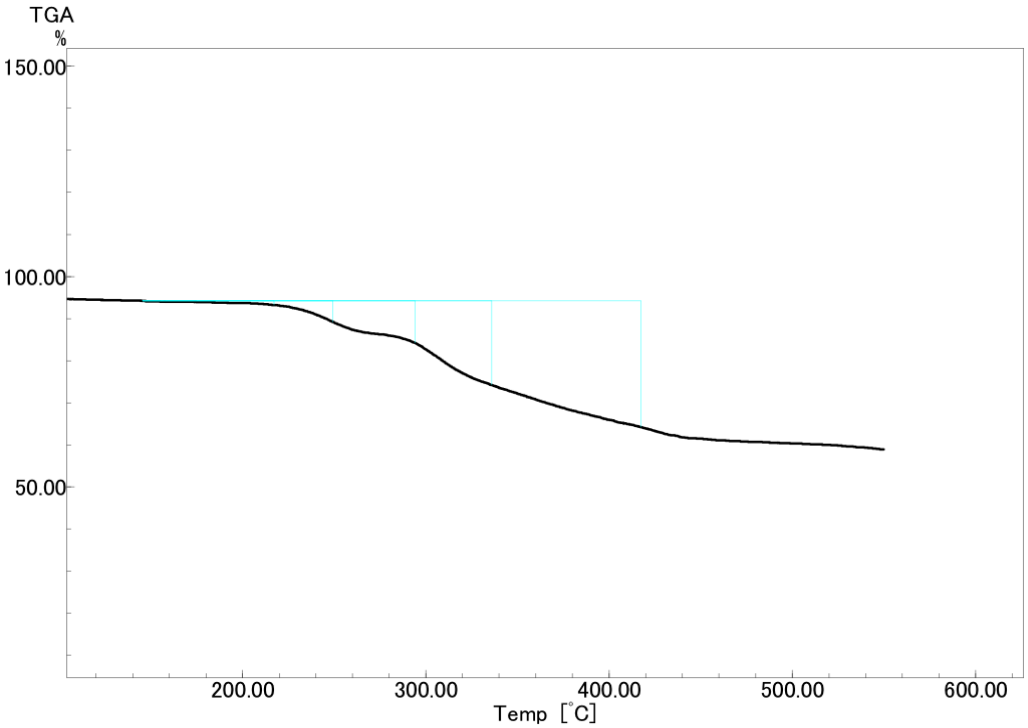
IR spectra of Meldrum's acid-functionalized PAN (NaCl) and cross-linked PAN (KBr).



IR spectra of Meldrum's acid-functionalized NR (NaCl) and cross-linked NR (KBr).



SEC profiles of **PAN**, **functionalized PAN** and **PEG-grafted PAN** (DMF, 303 K).



TGA profile of **3**.