Electronic Supplementary Material (ESI) for Polymer Chemistry.

Preparation and property investigation of chain end functionalized *cis*-1,4 polybutadienes via de-polymerization and cross metathesis of *cis*-1,4 polybutadienes

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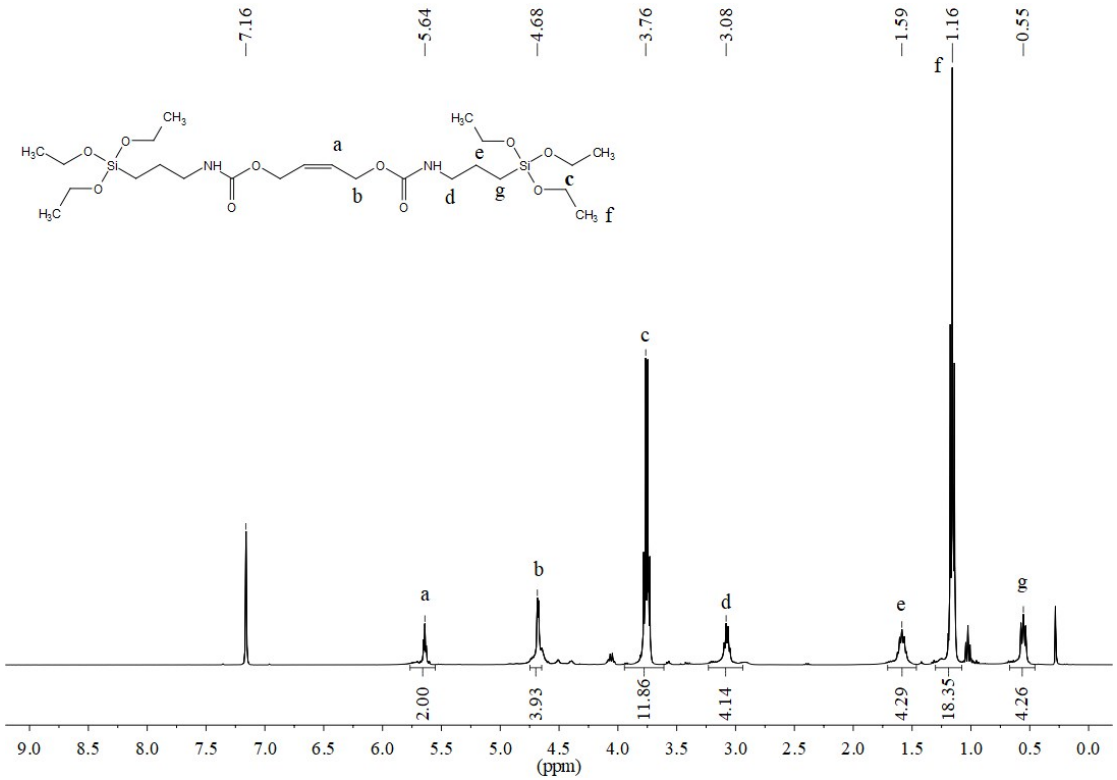

Figure 1S ^{1}H NMR spectra of **CTA-Si(OEt)$_3$**

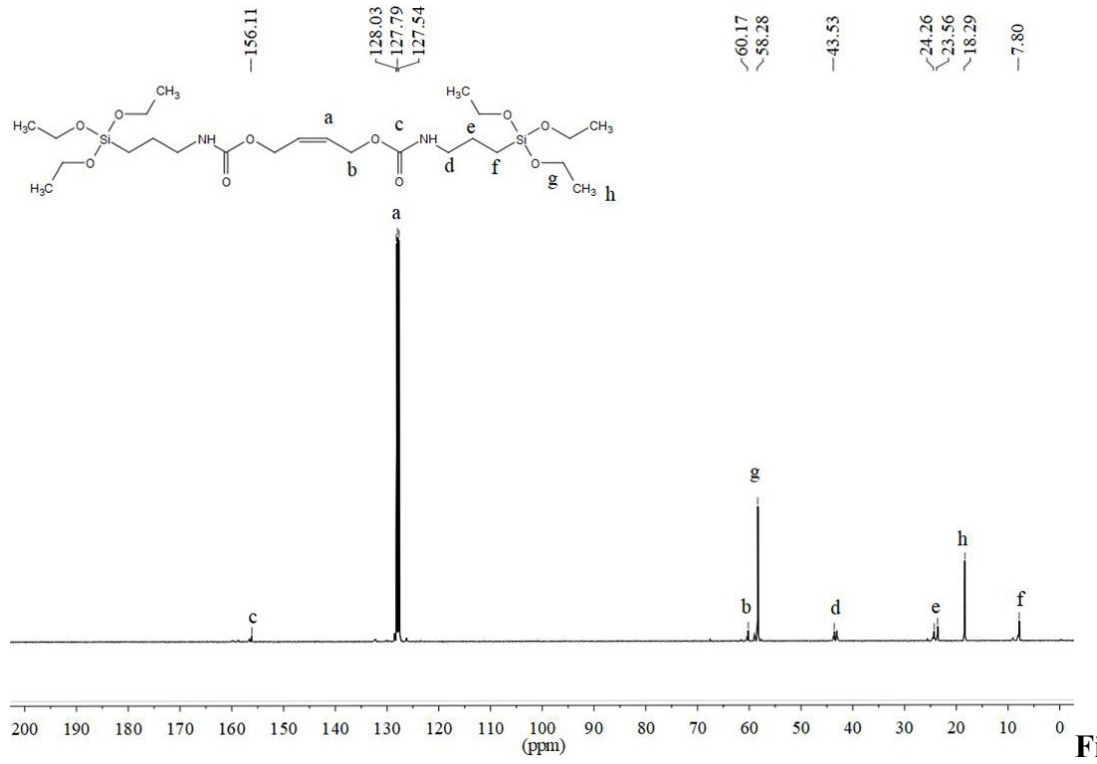

Figure 2S ^{13}C NMR spectra of **CTA-Si(OEt)$_3$**

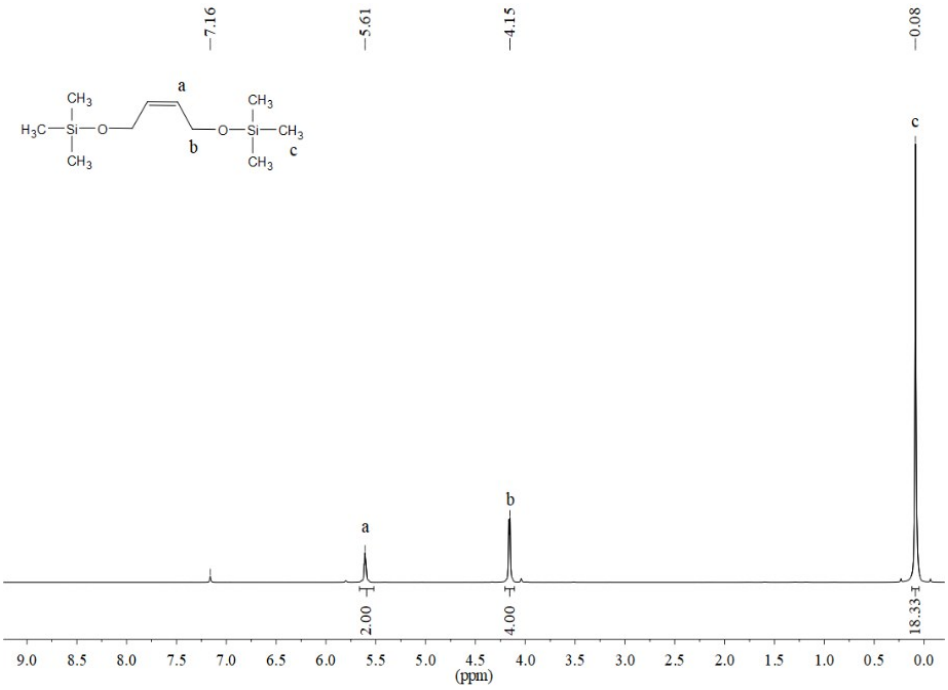

Figure 3S ^{1}H NMR spectra of **CTA-SiMe$_3$**

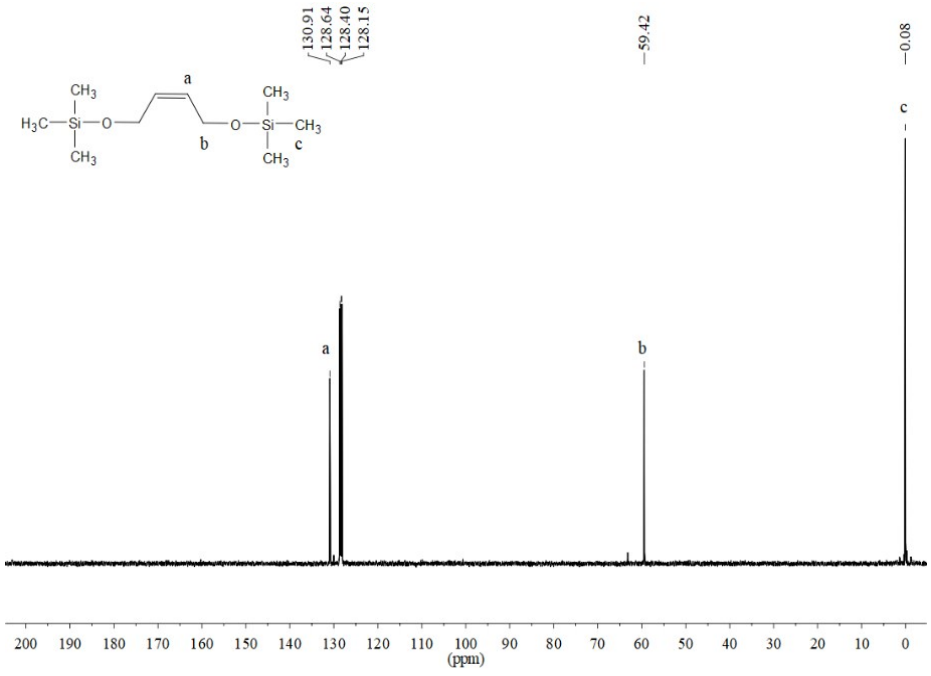

Figure 4S ^{13}C NMR spectra of **CTA-SiMe$_3$**

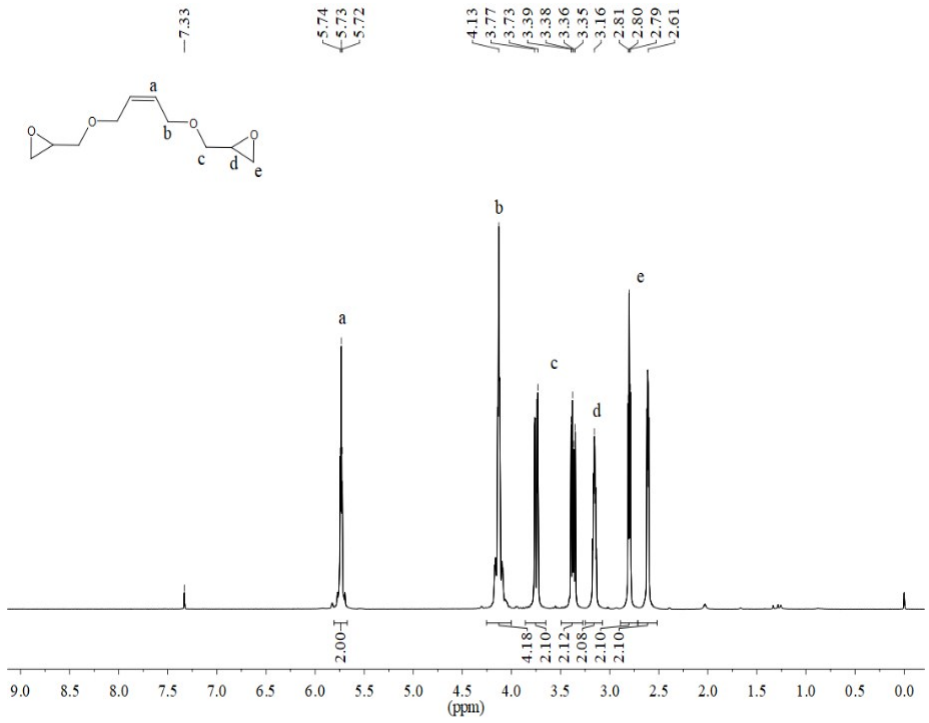

Figure 5S ^{1}H NMR spectra of **CTA-PO**

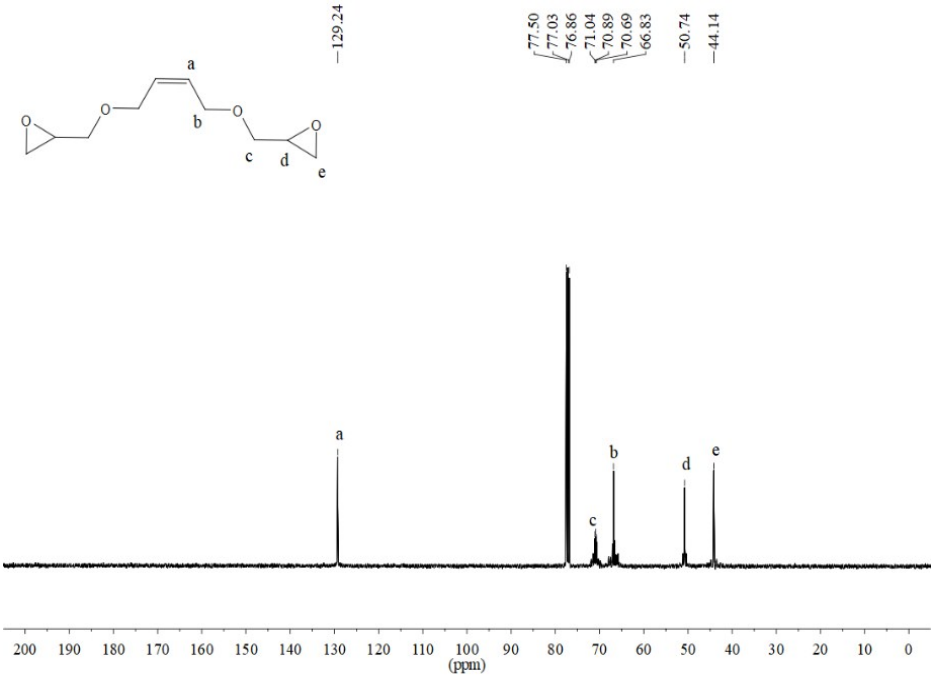

Figure 6S ^{13}C NMR spectra of **CTA-PO**

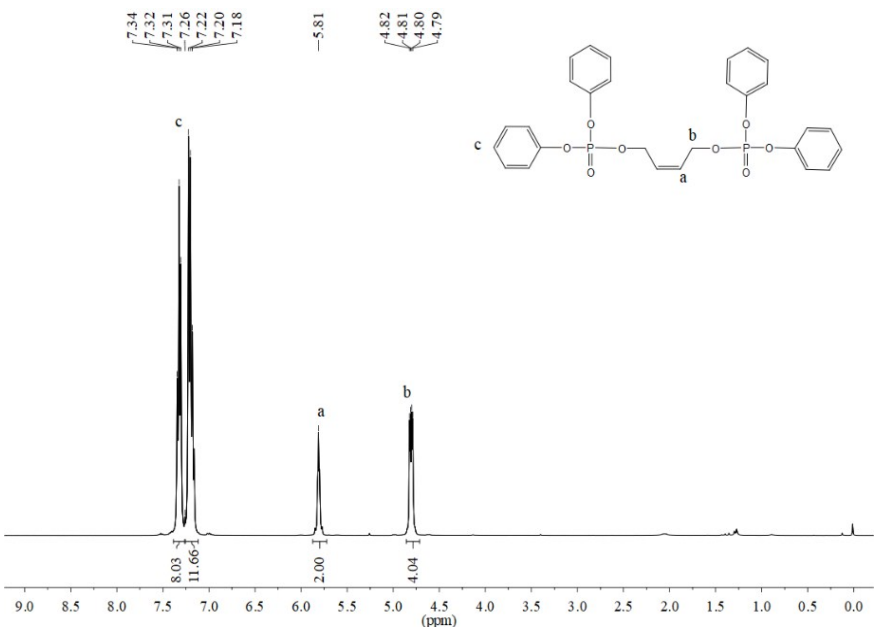

Figure 7S ^{1}H NMR spectra of **CTA-Phosphate**

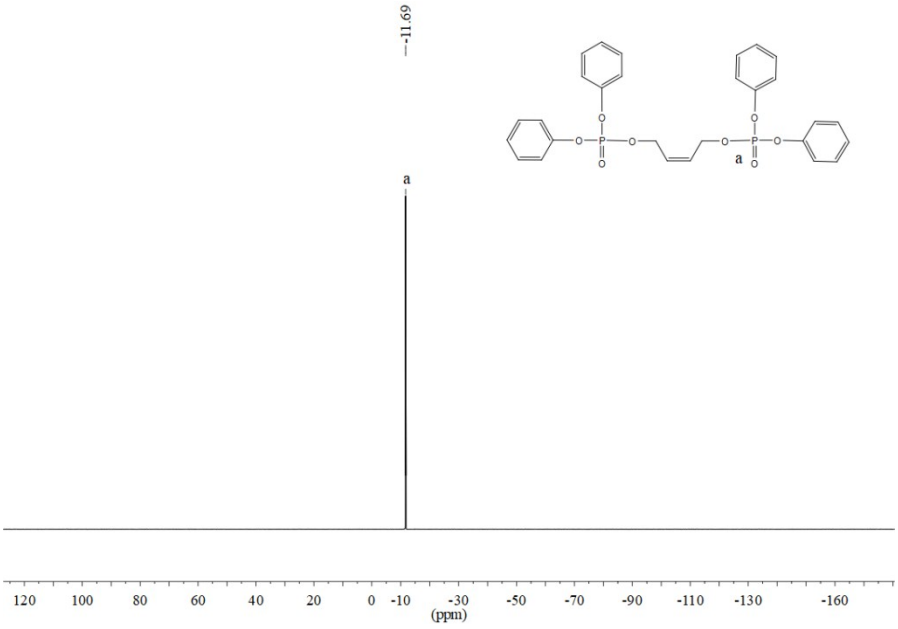

Figure 8S ^{31}P NMR spectra of **CTA-Phosphate**

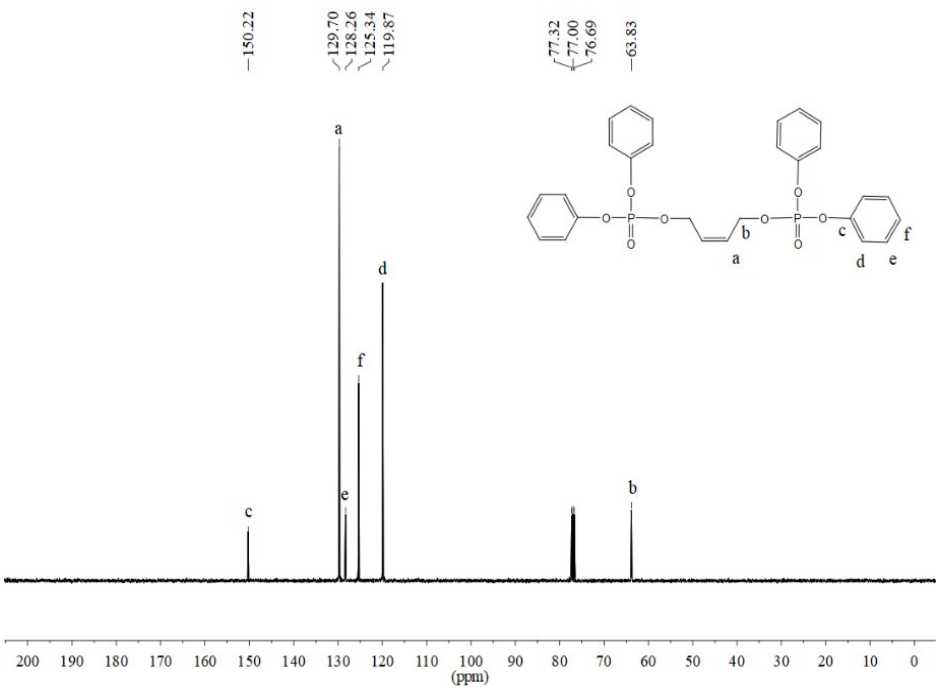

Figure 9S ^{13}C NMR spectra of **CTA-Phosphate**

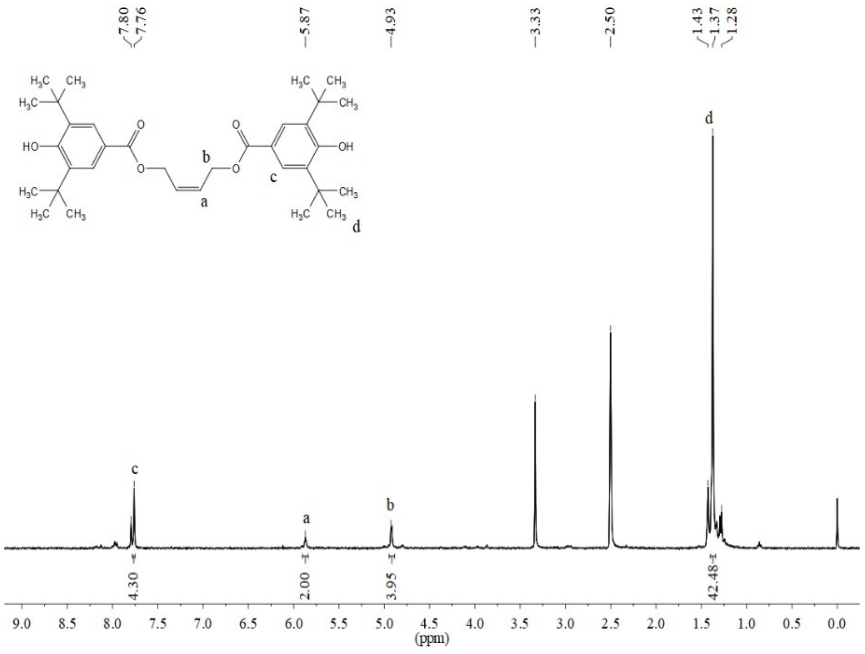

Figure 10S ^{1}H NMR spectra of **CTA-Phenol**

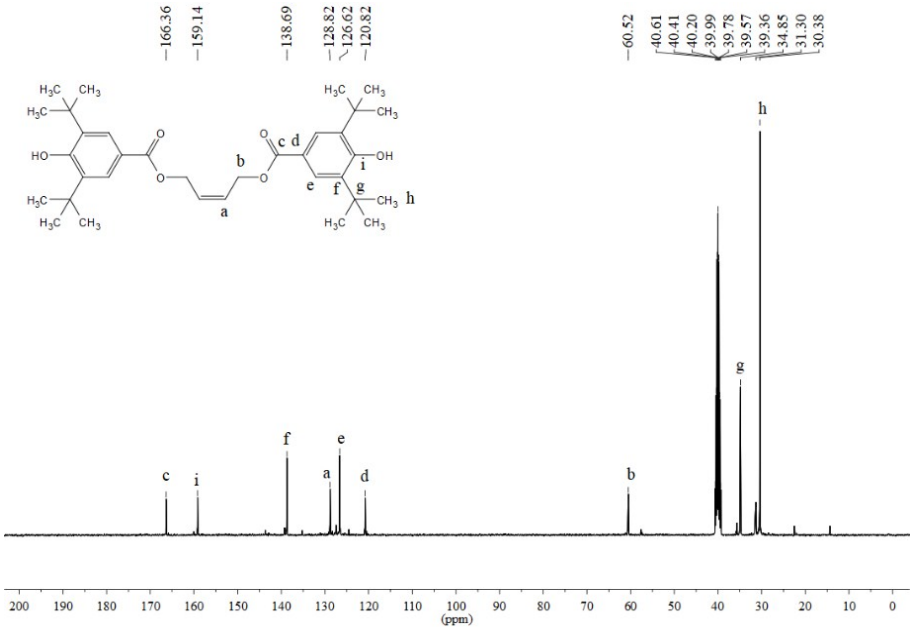

Figure 11S ^{13}C NMR spectra of **CTA-Phenol**

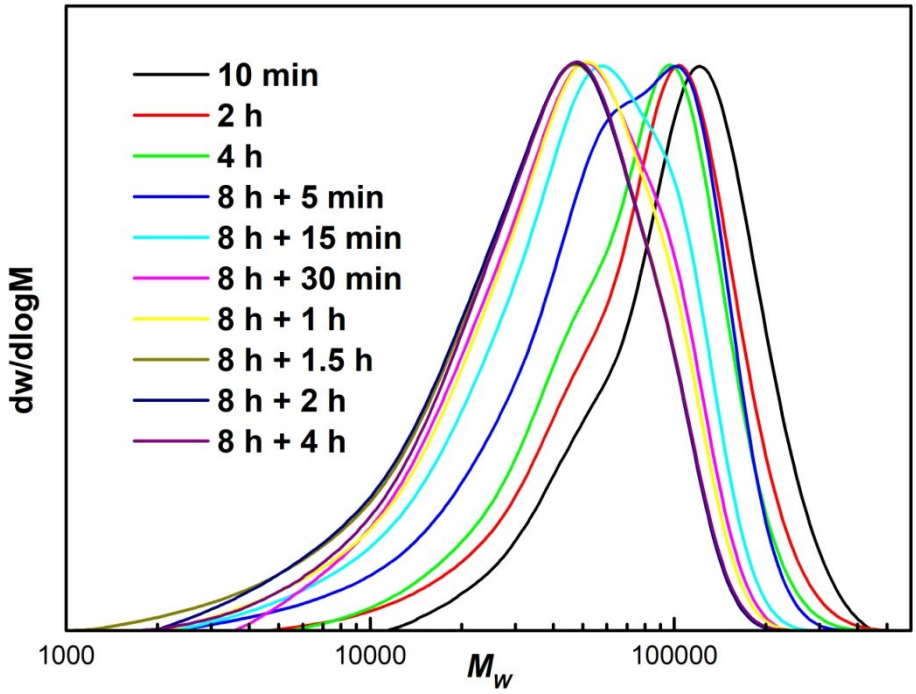

Figure 12S The GPC profiles evolution with the depolymerization (before 8 h) and cross metathesis time (after 8 h)

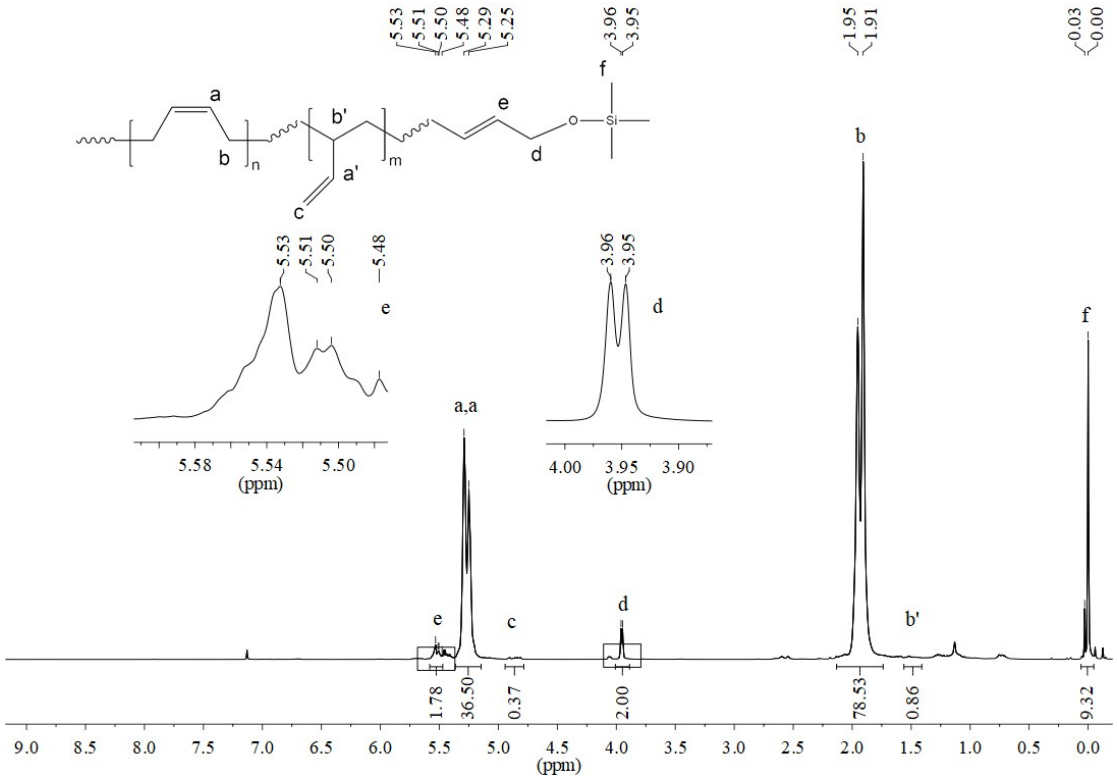

Figure 13S ^{1}H NMR spectra of **PBD-SiMe$_3$**.

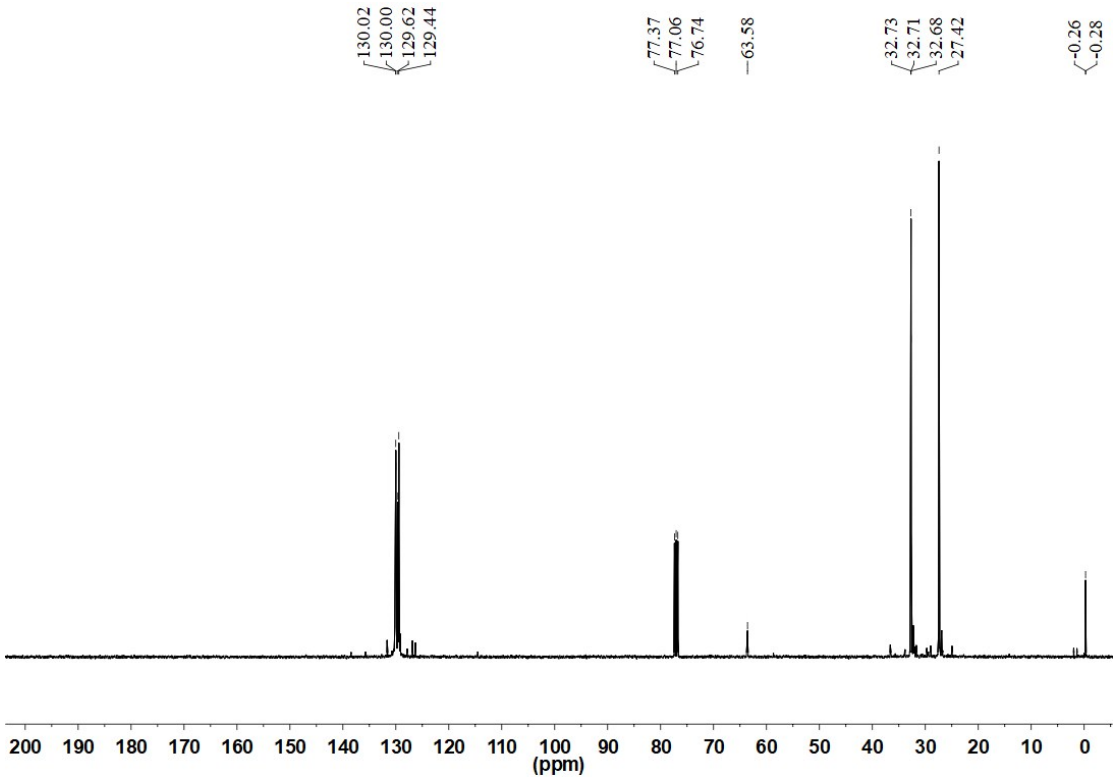

Figure 14S ^{13}C NMR spectra of **PBD-SiMe$_3$**.

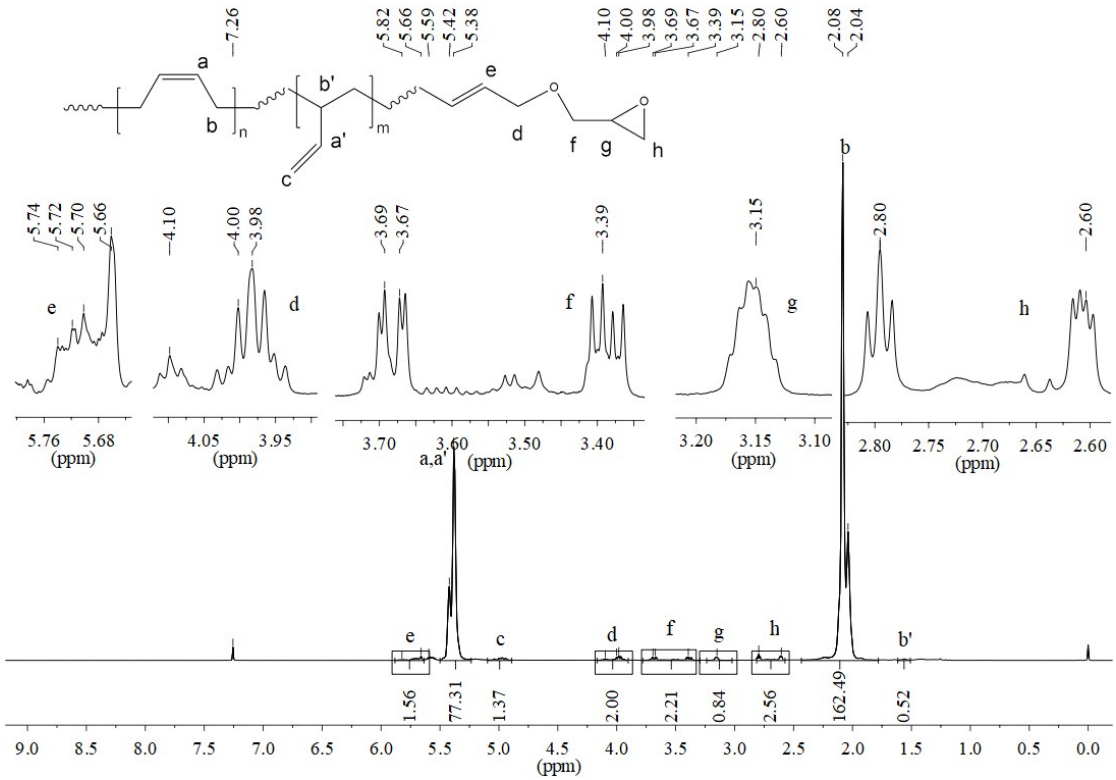

Figure 15S ^{1}H NMR spectra of **PBD-PO**

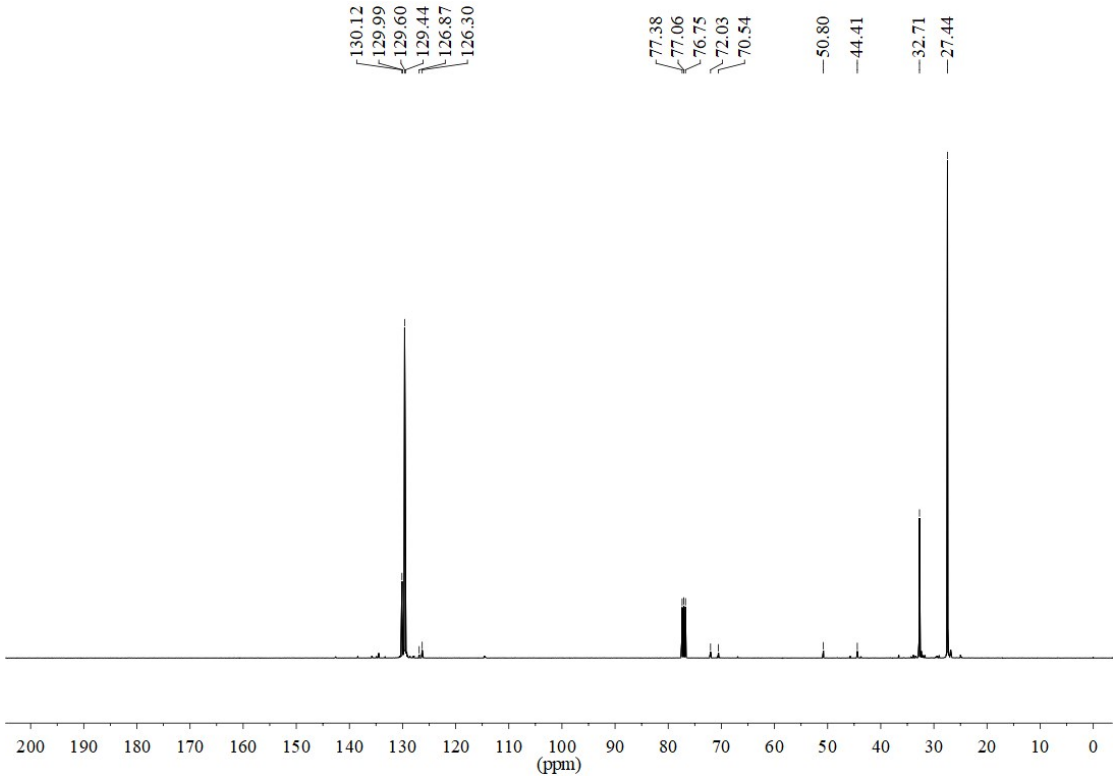

Figure 16S ^{13}C NMR spectra of **PBD-PO**

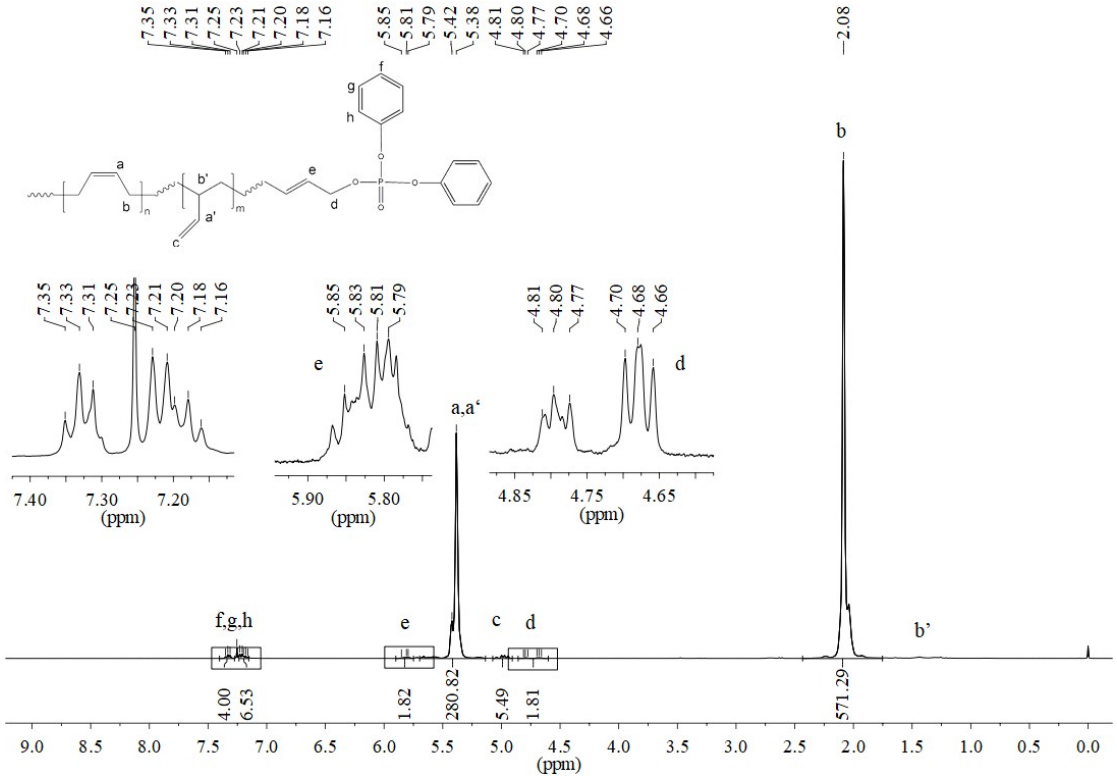

Figure 17S ^{1}H NMR spectra of **PBD-Phosphate**.

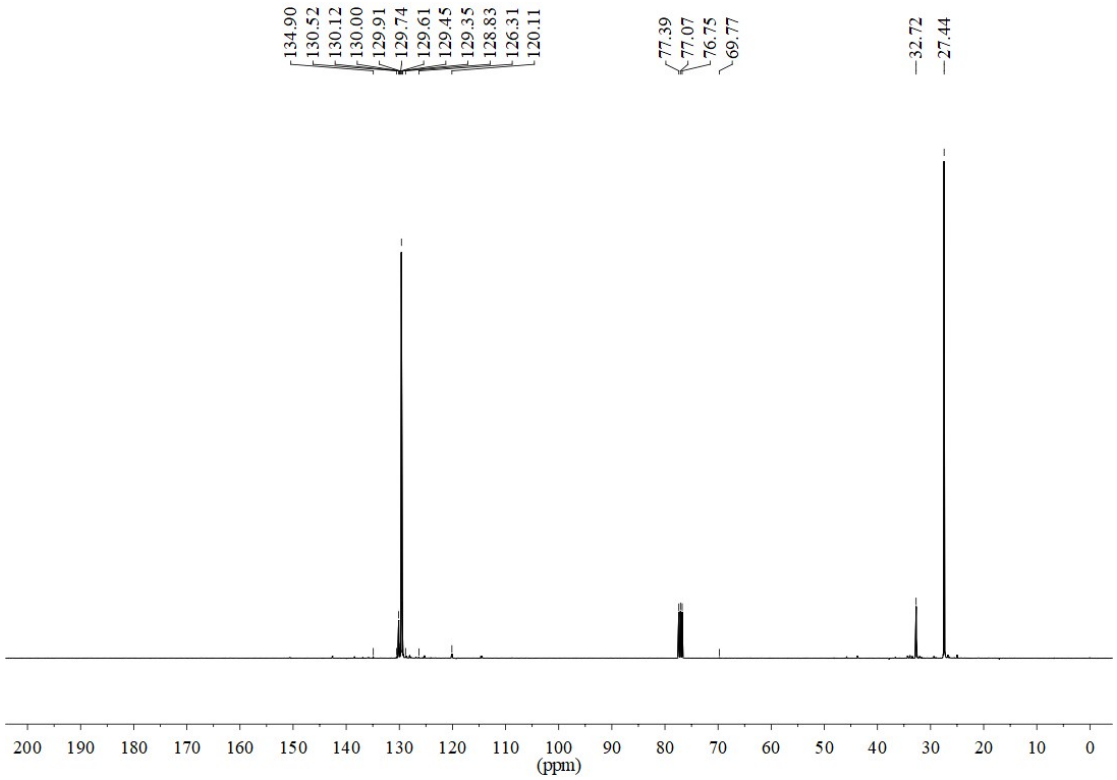

Figure 18S ^{1}H NMR spectra of **PBD-Phosphate**.

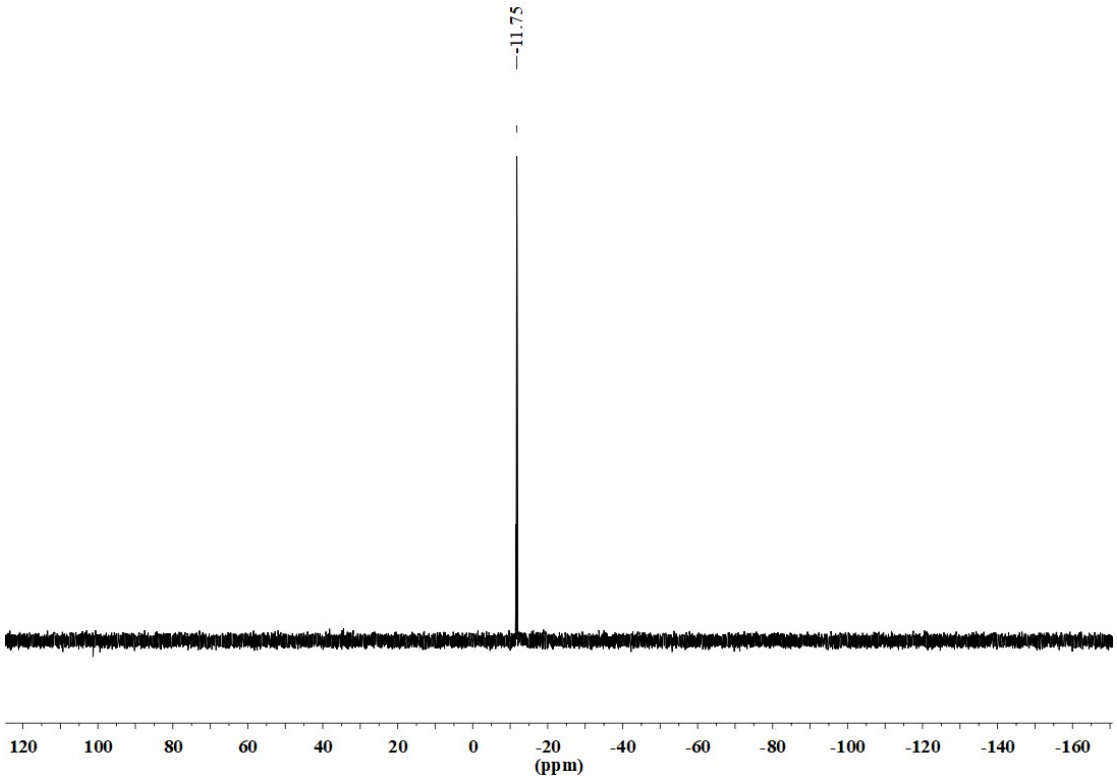

Figure 19S ^{31}P NMR spectra of **PBD-Phosphate**.

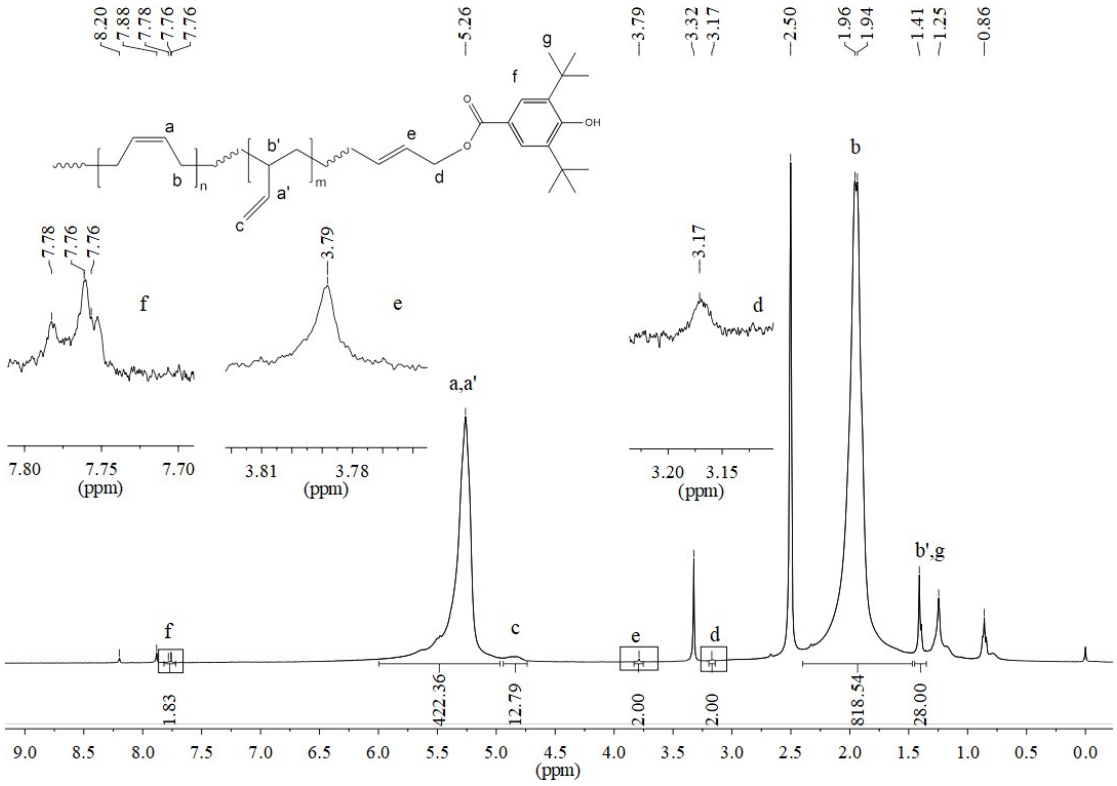

Figure 20S ^{1}H NMR spectra of **PBD-Phenol**

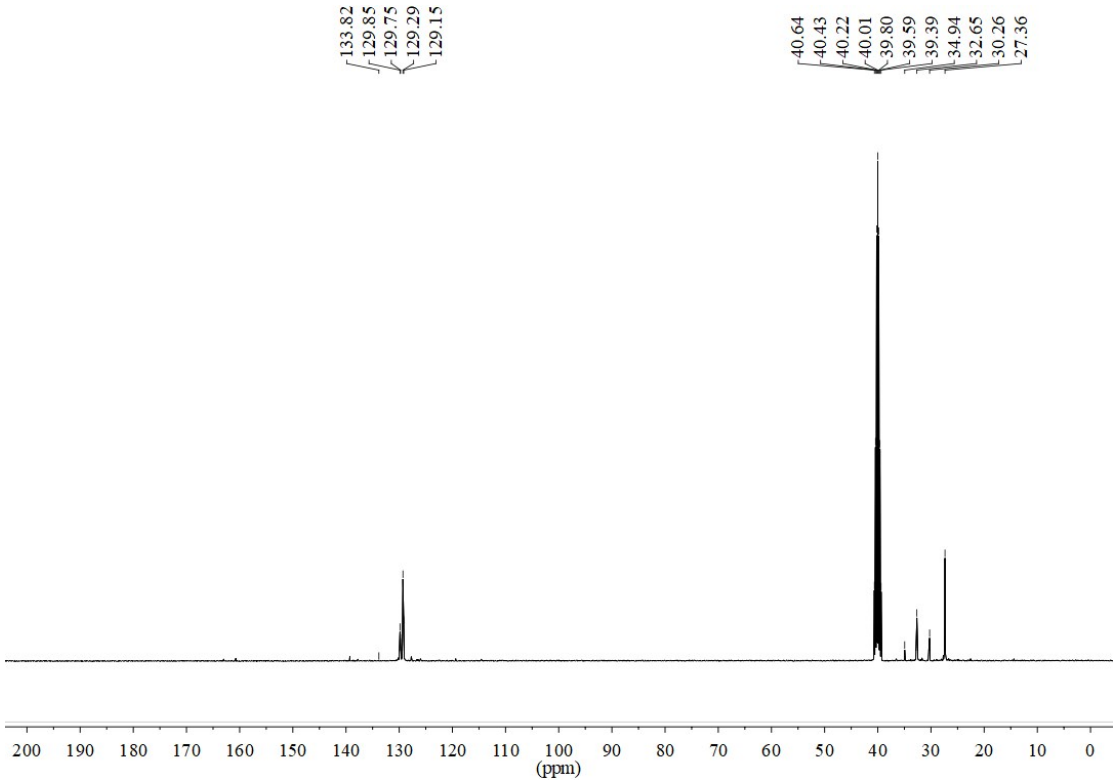

Figure 21S ^{13}C NMR spectra of **PBD-Phenol**

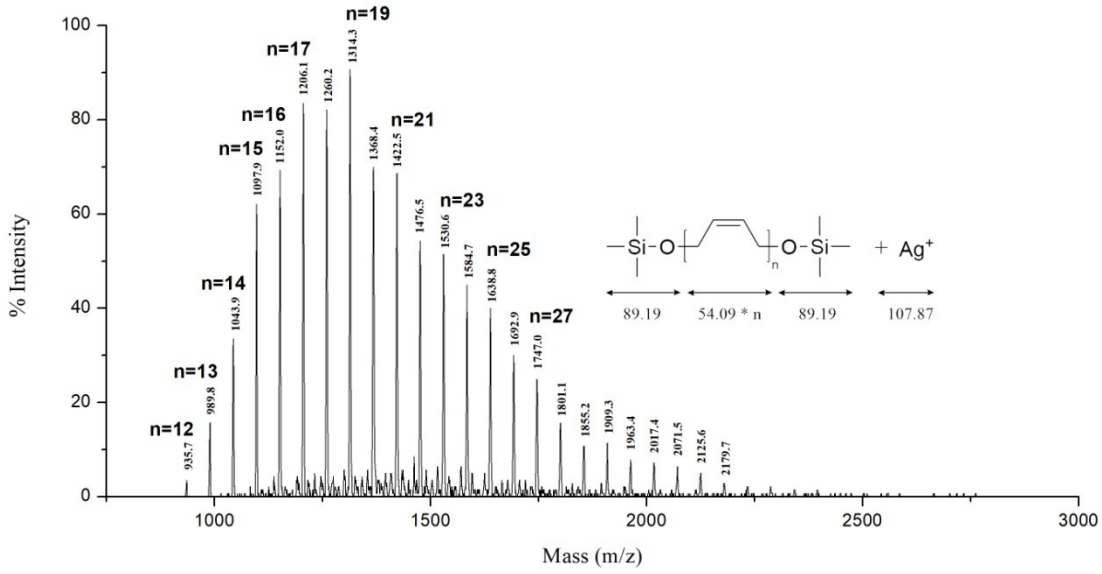

Figure 22S MALDI-ToF mass spectrum (DCTB matrix, silver ionizing salt) of **PBD-SiMe$_3$**

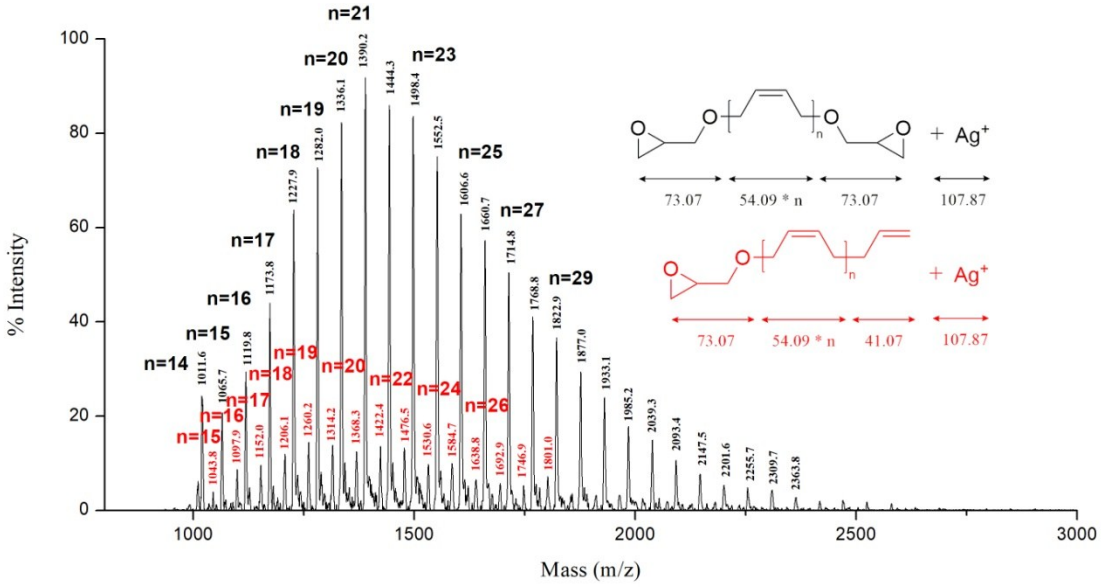

Figure 23S MALDI-ToF mass spectrum (DCTB matrix, silver ionizing salt) of **PBD-PO**

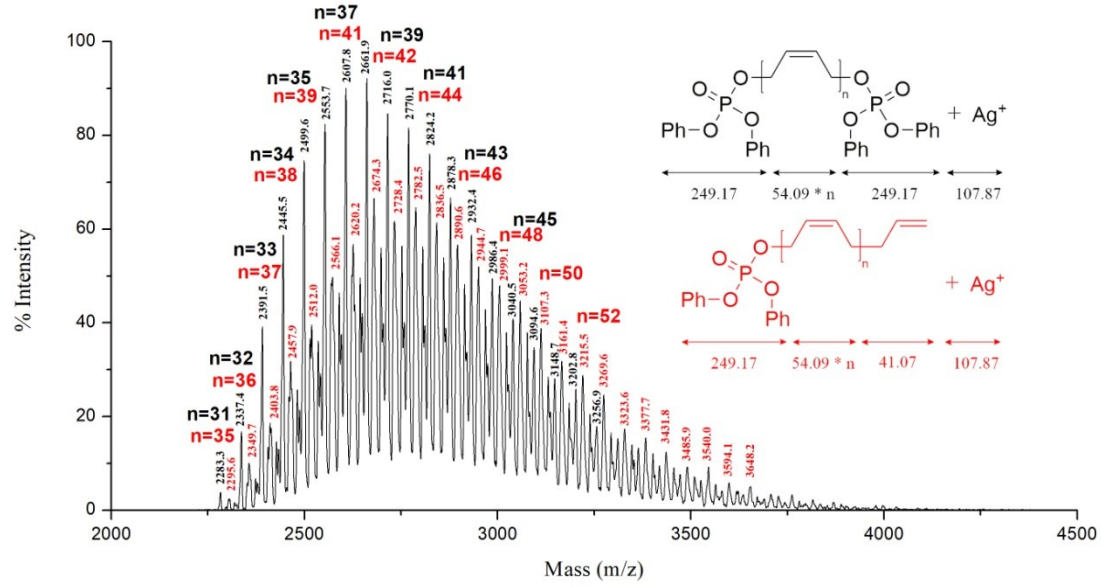

Figure 24S MALDI-ToF mass spectrum (DCTB matrix, silver ionizing salt) of **PBD-Phosphate**

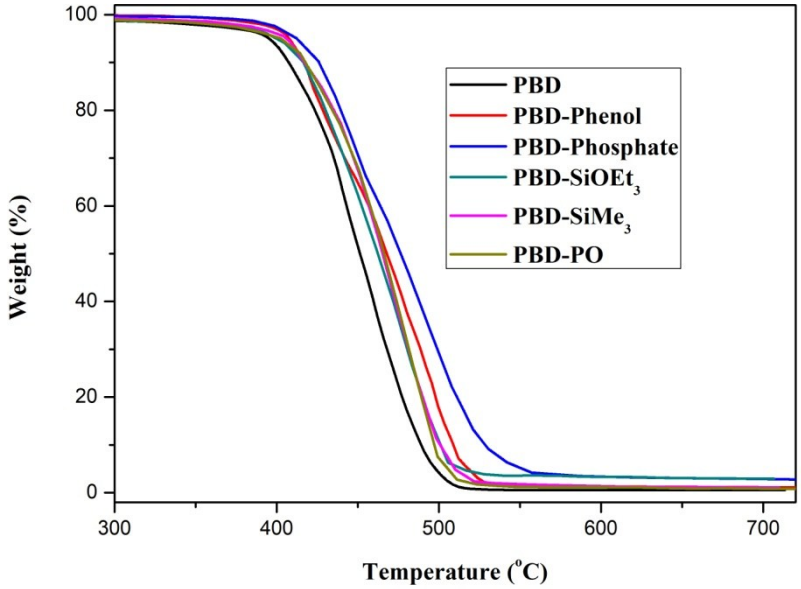

Figure 25S The TGA profiles of functionalized polybutadiene with various end groups

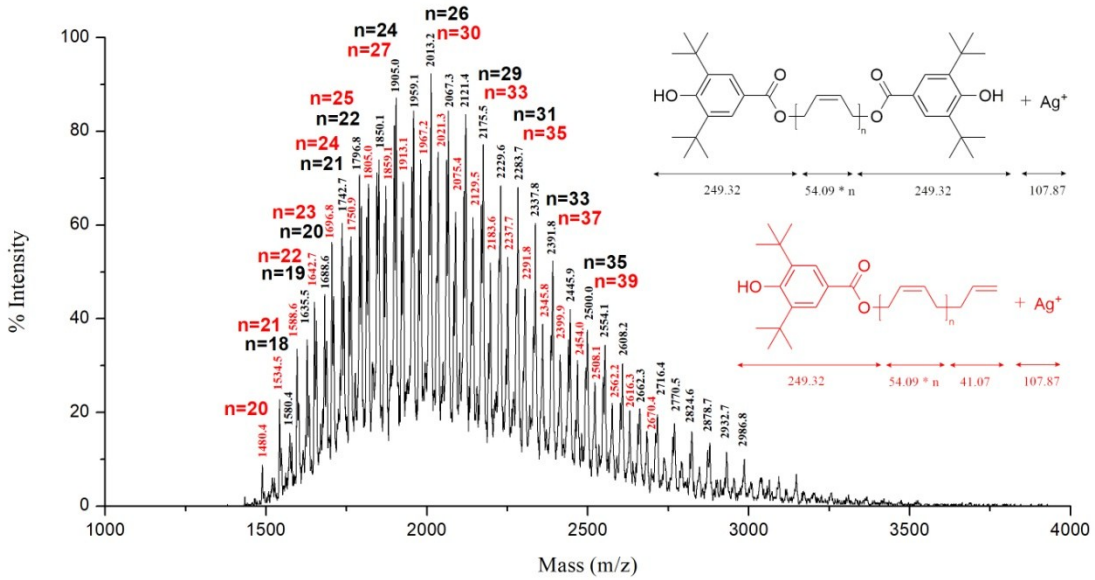

Figure 26S MALDI-ToF mass spectrum (DCTB matrix, silver ionizing salt) of **PBD-Phenol**

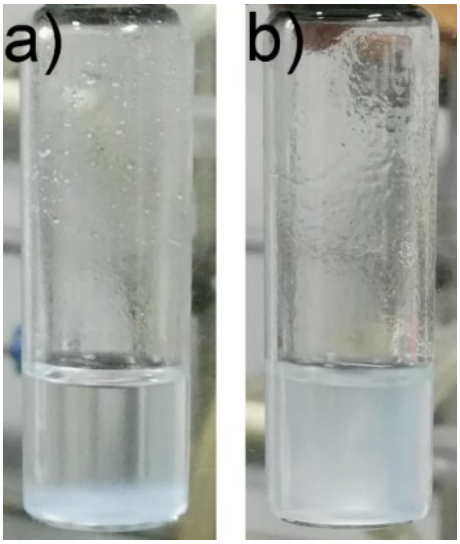

Figure 27S a) $Si(OEt)_3$-PBD modified SiO_2 suspension, after 24 h resting. (PBD-$Si(OEt)_3$: SiO_2 = 1:5), **b**) unmodified SiO_2 suspension in THF, after 24 h resting

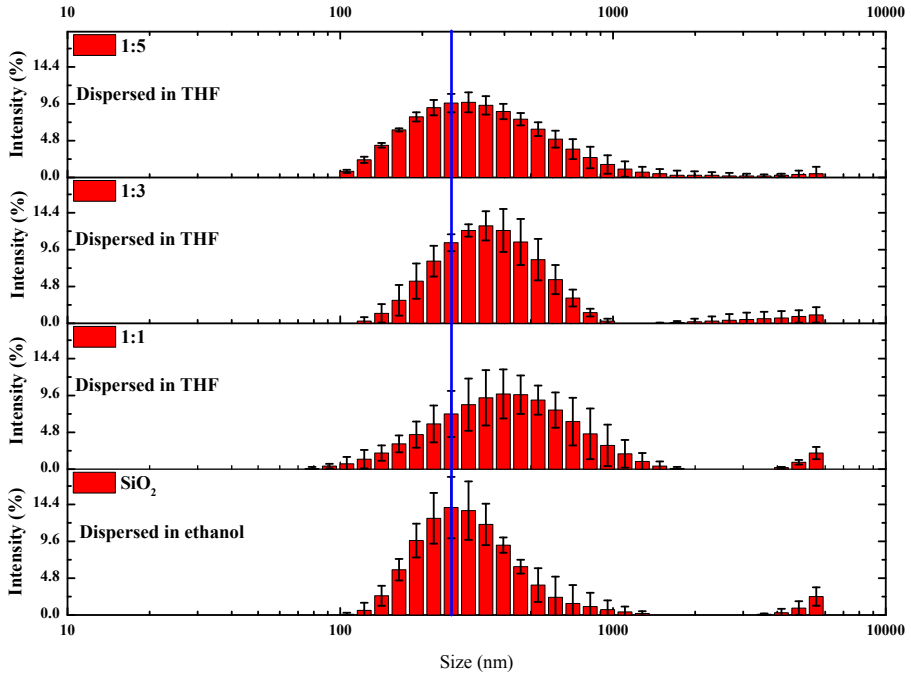

Figure 28S Particle size distribution of samples **PBD-Si(OEt)$_3$: SiO$_2$** = 1:3, 1:5, 1:1 in THF and pure **SiO$_2$** in ethanol.

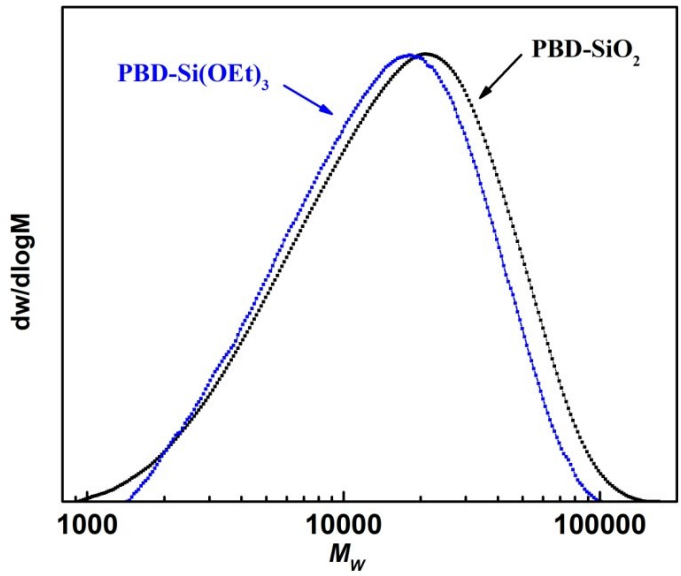

Figure 29S The GPC profile evolution of **PBD-Si(OEt)$_3$** (before hydrolysis on SiO_2) **PBD-SiO$_2$** (after hydrolysis on SiO_2).

Table 1S Composition of mixes.

	BR	**10PSiO$_2$**	**10MPSiO$_2$**	**30PSiO$_2$**	**30MPSiO$_2$**
Filler, phr	none	SiO_2 10	SiO_2-PBD 10	SiO_2 30	SiO_2-PBD 30
Base mix, phr	BR 100; ZnO 4;	Stearic acid 2;	Sulphur 1.5;	CZ 1.5, D 0.5;	4010NA 1

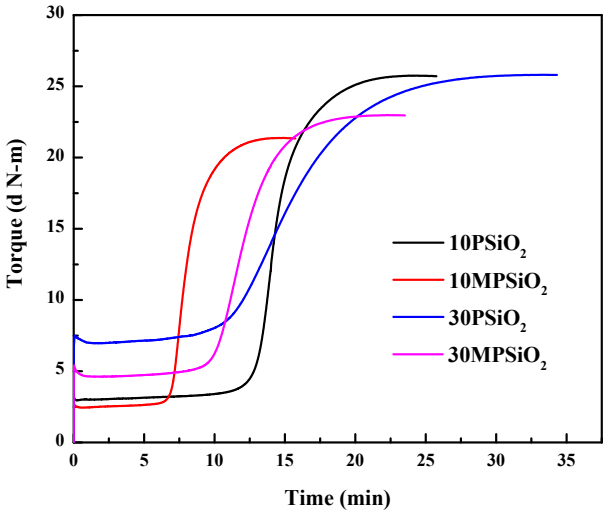

Figure 30S Cure rheographs of PBD blends containing pure SiO_2 and **SiO$_2$-PBD** at 150 °C