

Synthesis of a novel linear α , ω -di (chloro phosphoramidate) polydimethylsiloxane and its applications in improving flame-retardant and water-repellent properties of cotton fabrics

Chaohong Dong, Ling Sun, Xingbo Ma, Zhou Lu *, Pengshuang He, Ping Zhu *

Institute of Functional Textiles and Advanced Materials, State Key Laboratory of Bio-Fibers and Eco-Textiles, College of Textile and Clothing, Qingdao University, Qingdao 266000, China.

Electronic Supplementary information

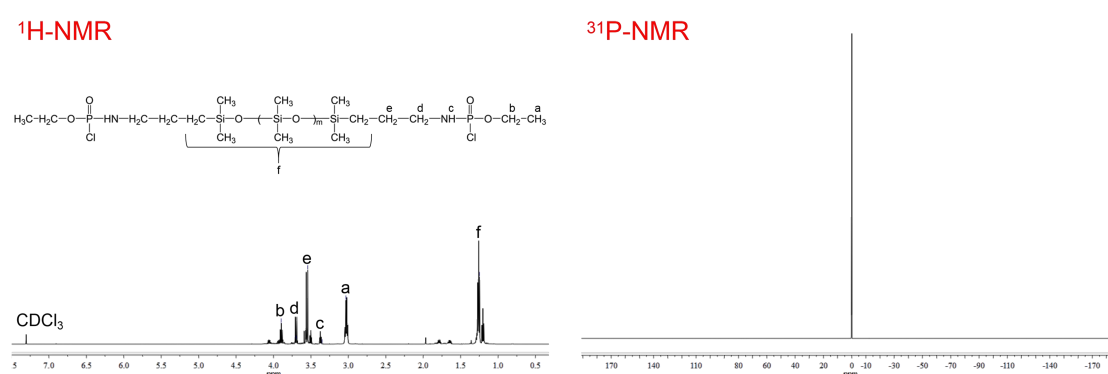


Figure S1. ^1H NMR and ^{31}P NMR spectra of CPN-PDMS.

^1H NMR and ^{31}P NMR spectrum of CPN-PDMS are presented in Fig. S1. As shown in the ^1H NMR spectra, the peaks appeared at 2.95-3.08 ppm, 3.84-3.92 ppm corresponding to $-\text{CH}_3$ and $-\text{CH}_2-$ of dichloroethyl phosphate. The peaks at 3.65-3.72 ppm, 3.48-3.59 ppm and 1.15-1.36 ppm were attributed to d, e and f (derived from PDMS- 2NH_2). Furthermore, the peak of $-\text{NH}-$ group connecting dichloroethyl phosphate with PDMS- 2NH_2 in the ^1H NMR spectra was shown at 3.30-3.41 ppm, which suggests successful reaction happens between dichloroethyl phosphate with PDMS- 2NH_2 . The single signal at -0.05 ppm in the ^{31}P NMR spectra was corresponded with the unique phosphorus in the CPN-PDMS, indicating that this product has a high purity.