

Electronic Supporting Information  
for  
Exploring Shape Amphiphiles beyond Giant Surfactants: Molecular  
Design and Click Synthesis

Kan Yue,<sup>a</sup> Chang Liu,<sup>a</sup> Kai Guo,<sup>a</sup> Kan Wu,<sup>a</sup> Xue-Hui Dong,<sup>a</sup> Hao Liu,<sup>a</sup> Mingjun Huang,<sup>a</sup>

Chrys Wesdemiotis,<sup>a,b</sup> Stephen Z. D. Cheng,<sup>\* a</sup> and Wen-Bin Zhang<sup>\* a</sup>

<sup>a</sup>Department of Polymer Science, College of Polymer Science and Polymer Engineering,

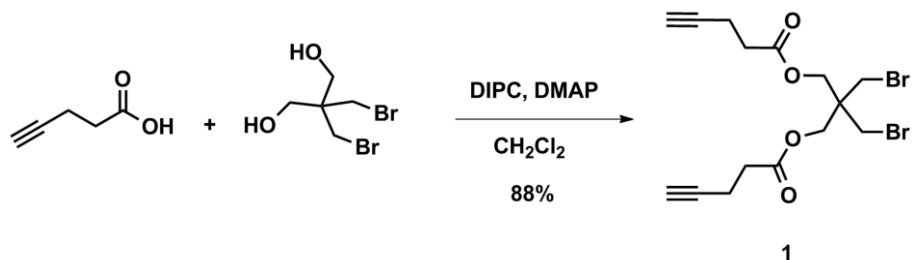
The University of Akron, Akron, Ohio 44325-3909, USA

<sup>b</sup>Department of Chemistry, The University of Akron, Akron, Ohio 44325-3601, USA

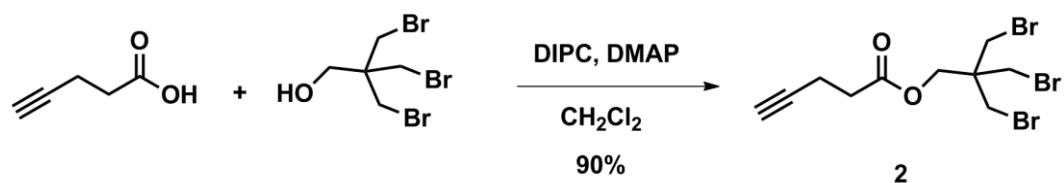
\* To whom correspondence should be addressed. E-mail: [scheng@uakron.edu](mailto:scheng@uakron.edu), [wz8@uakron.edu](mailto:wz8@uakron.edu)

## Contents

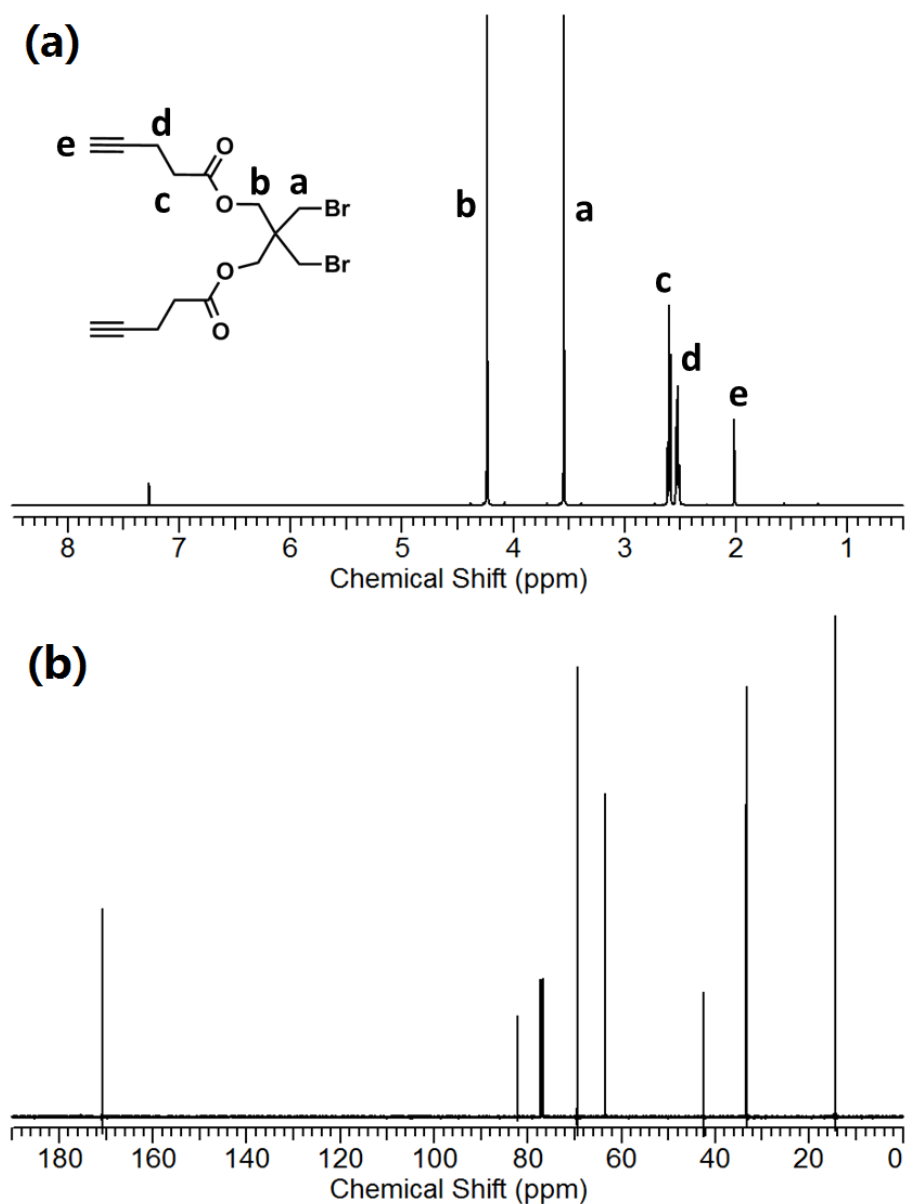
1. Scheme S1. Synthesis of Compound **1**.
2. Scheme S2. Synthesis of Compound **2**.
3. Figure S1. (a)  $^1\text{H}$  and (b)  $^{13}\text{C}$  NMR spectra of compound **1**.
4. Figure S2. (a)  $^1\text{H}$  and (b)  $^{13}\text{C}$  NMR spectra of compound **2**.
5. Figure S3.  $^{13}\text{C}$  NMR spectra of (a) VPOSS-PS-VPOSS and (b) DPOSS-PS-DPOSS. The asterisks indicate the resonance peaks from the solvent carbons and the triangle denotes the peaks from vinyl carbons.
6. Figure S4. FT-IR spectra of (a)  $\text{N}_3\text{-PS-N}_3$  (black curve), (b) VPOSS-PS-VPOSS (brown curve), and (c) DPOSS-PS-DPOSS (green curve).
7. Figure S5. MALDI-TOF MS spectrum of VPOSS-PS-VPOSS obtained in reflection mode with isotopic resolution. The inset shows the full spectrum.
8. Figure S6.  $^{13}\text{C}$  NMR spectra of (a) 2PS-2Br, (b) 2PS-2 $\text{N}_3$ , (c) 2VPOSS-2PS, and (d) 2DPOSS-2PS. The asterisks indicate the resonance peaks from the solvent carbons and the triangle denotes the peaks from vinyl carbons.
9. Figure S7. FT-IR spectra of (a) PS- $\text{N}_3$  (black curve), (b) 2PS-2Br (red curve), (c) 2PS-2 $\text{N}_3$  (blue curve), (d) 2VPOSS-2PS (brown curve), and (e) 2DPOSS-2PS (green curve).
10. Figure S8.  $^{13}\text{C}$  NMR spectra of (a) PS-3Br, (b) PS-3 $\text{N}_3$ , (c) 3VPOSS-PS, and (d) 3DPOSS-PS. The asterisks indicate the resonance peaks from the solvent carbons and the triangle denotes the peaks from vinyl carbons.
11. Figure S9. FT-IR spectra of (a) PS- $\text{N}_3$  (black curve), (b) PS-3Br (red curve), (c) PS-3 $\text{N}_3$  (blue curve), (d) 3VPOSS-PS (brown curve), and (e) 3DPOSS-PS (green curve).



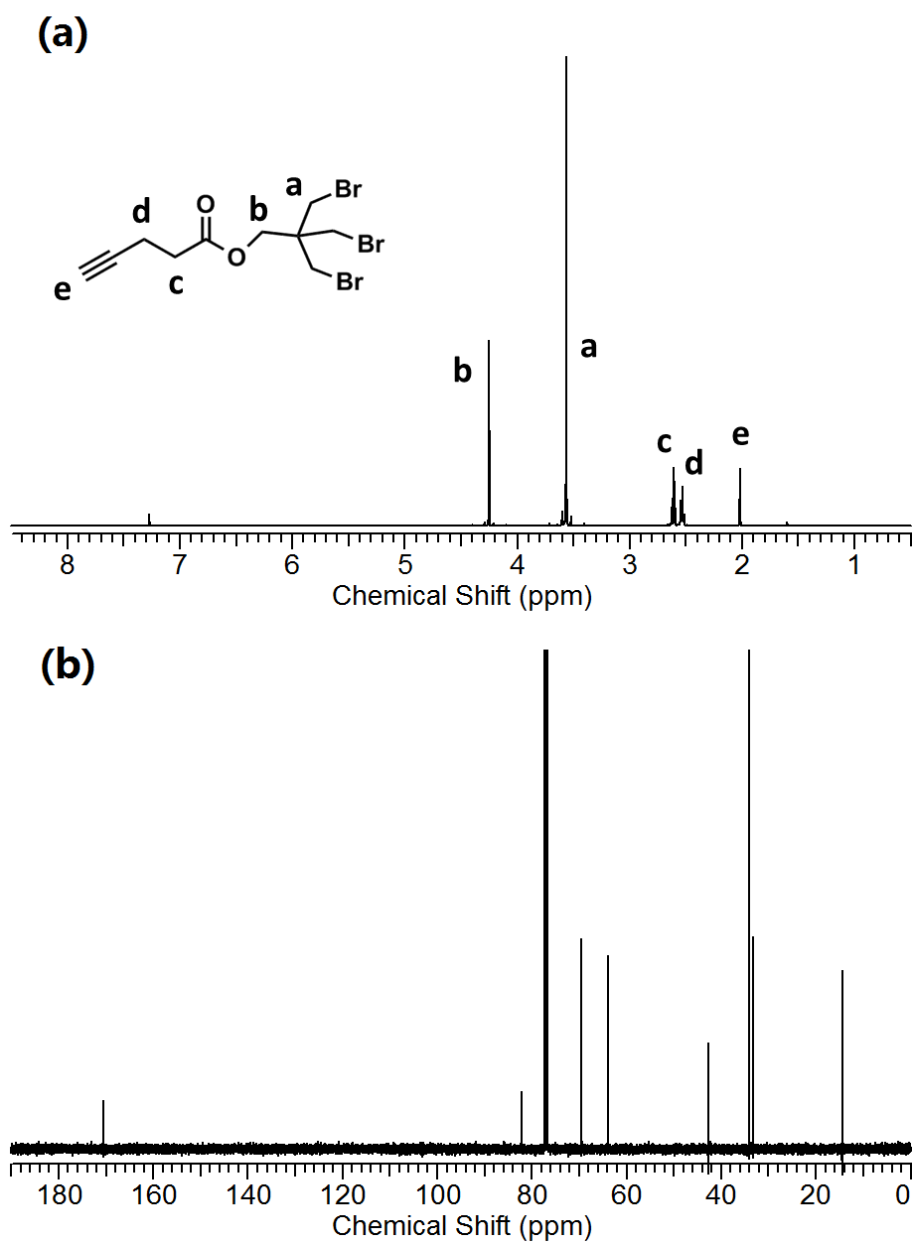
**Scheme S1.** Synthesis of Compound 1.



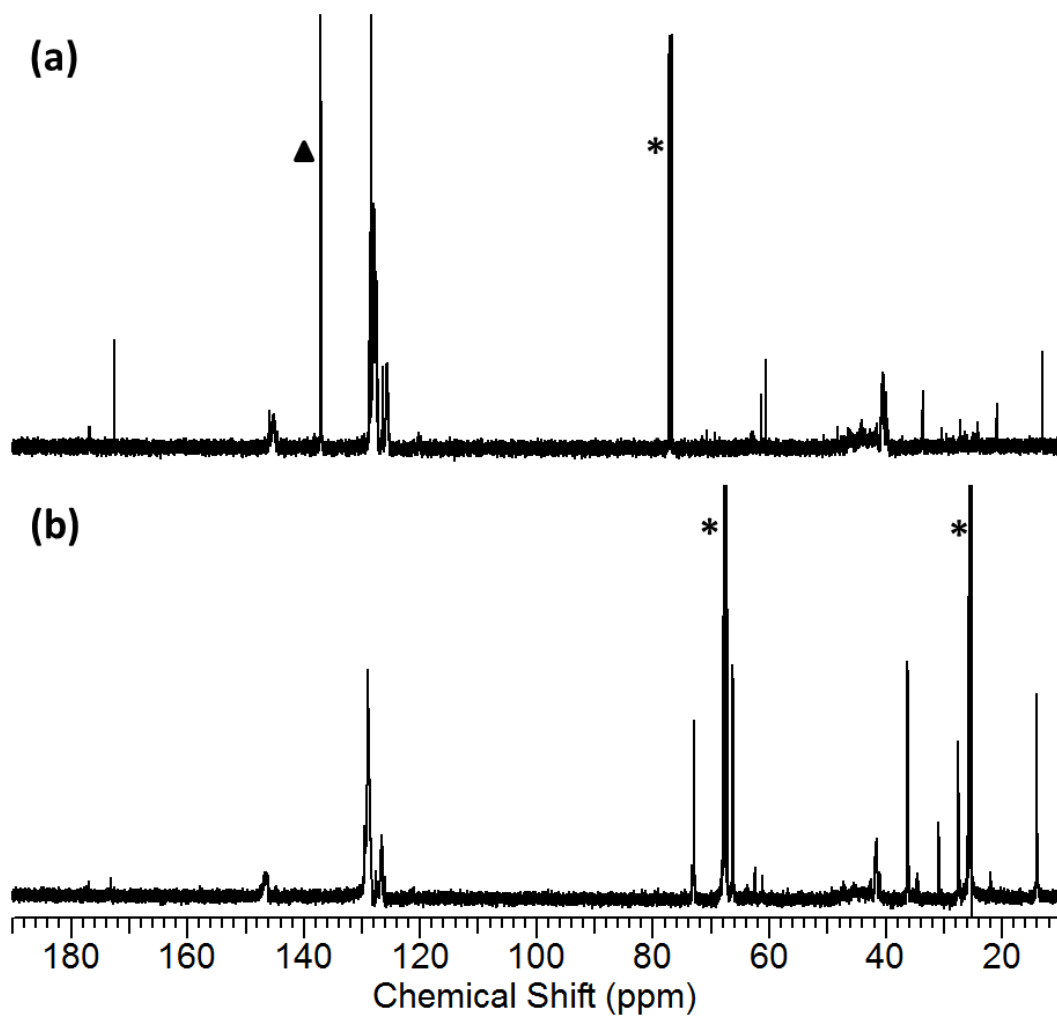
**Scheme S2.** Synthesis of Compound 2.



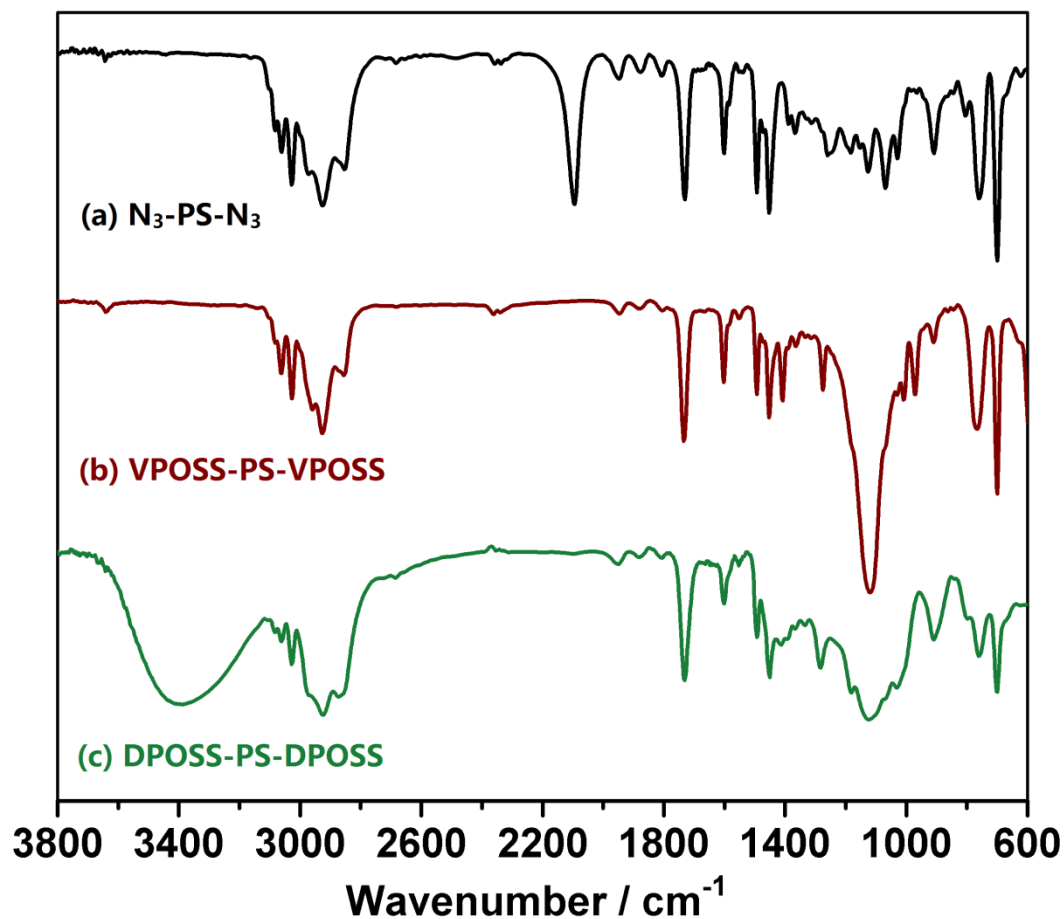
**Figure S1.** (a)  $^1\text{H}$  and (b)  $^{13}\text{C}$  NMR spectra of compound 1.



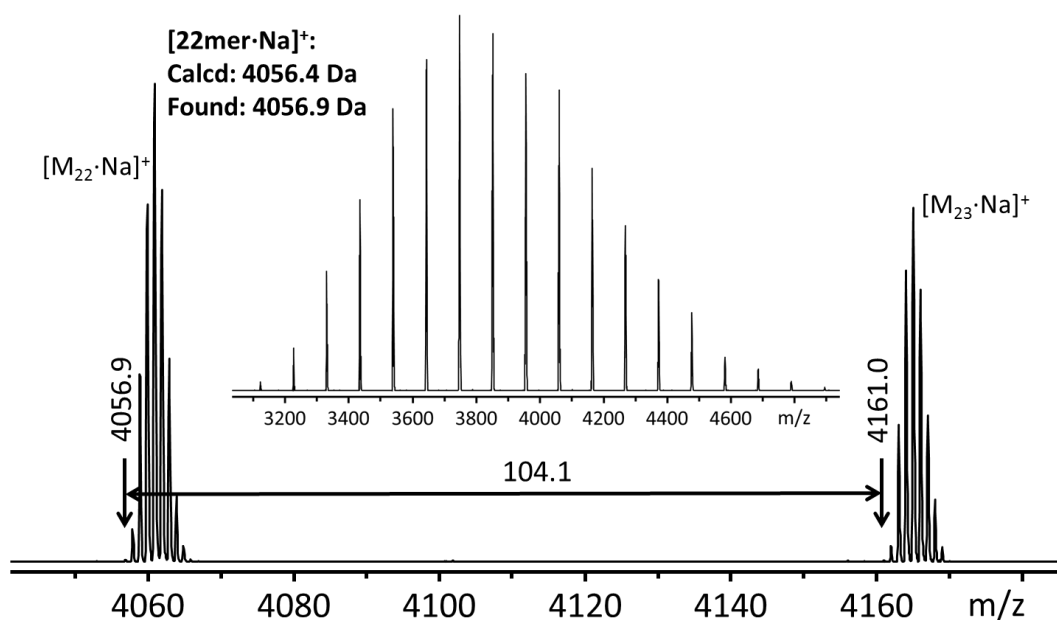
**Figure S2.** (a)  $^1\text{H}$  and (b)  $^{13}\text{C}$  NMR spectra of compound **2**.



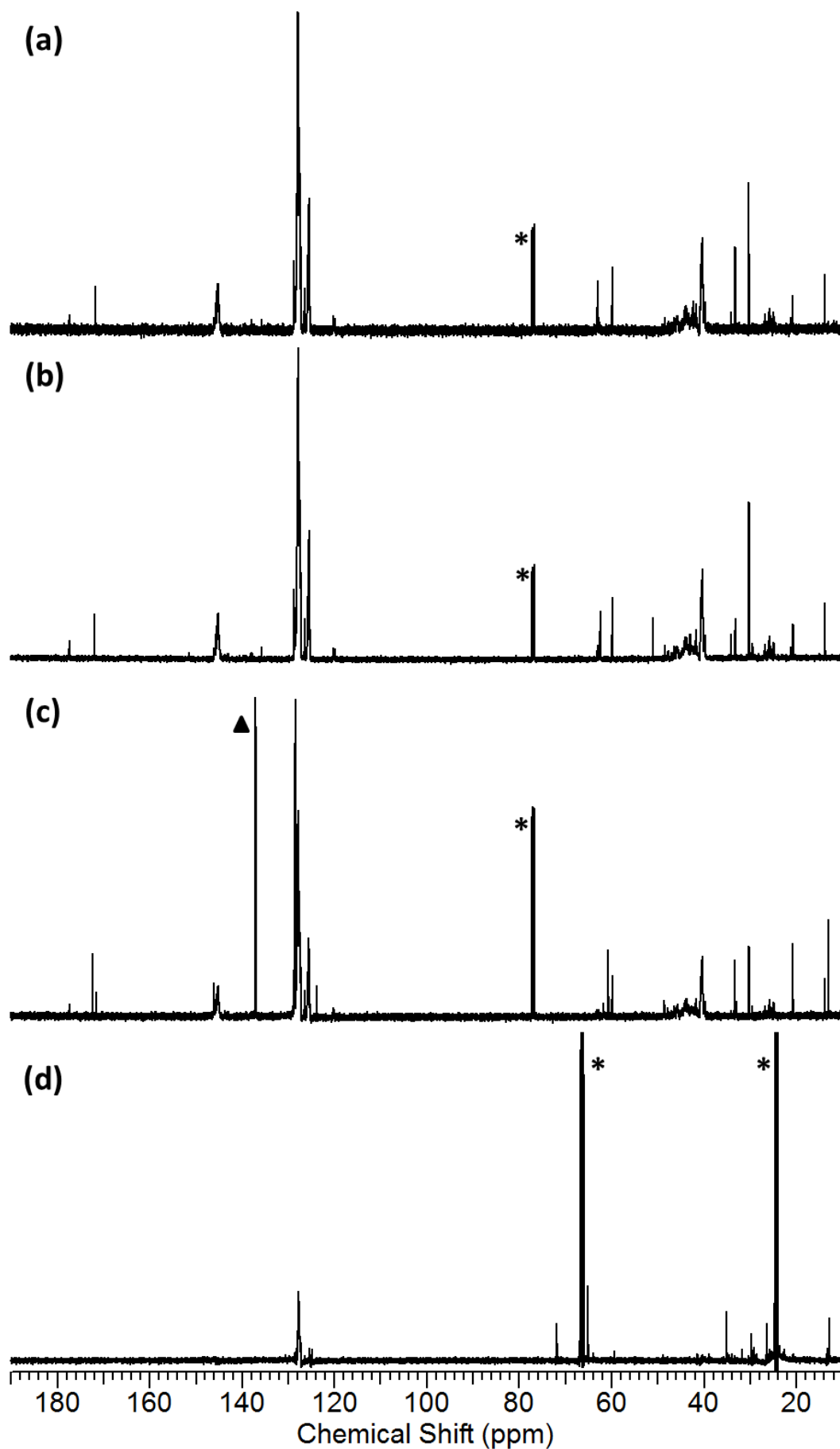
**Figure S3.**  $^{13}\text{C}$  NMR spectra of (a) VPOSS-PS-VPOSS and (b) DPOSS-PS-DPOSS. The asterisks indicate the resonance peaks from the solvent carbons and the triangle denotes the peaks from vinyl carbons.



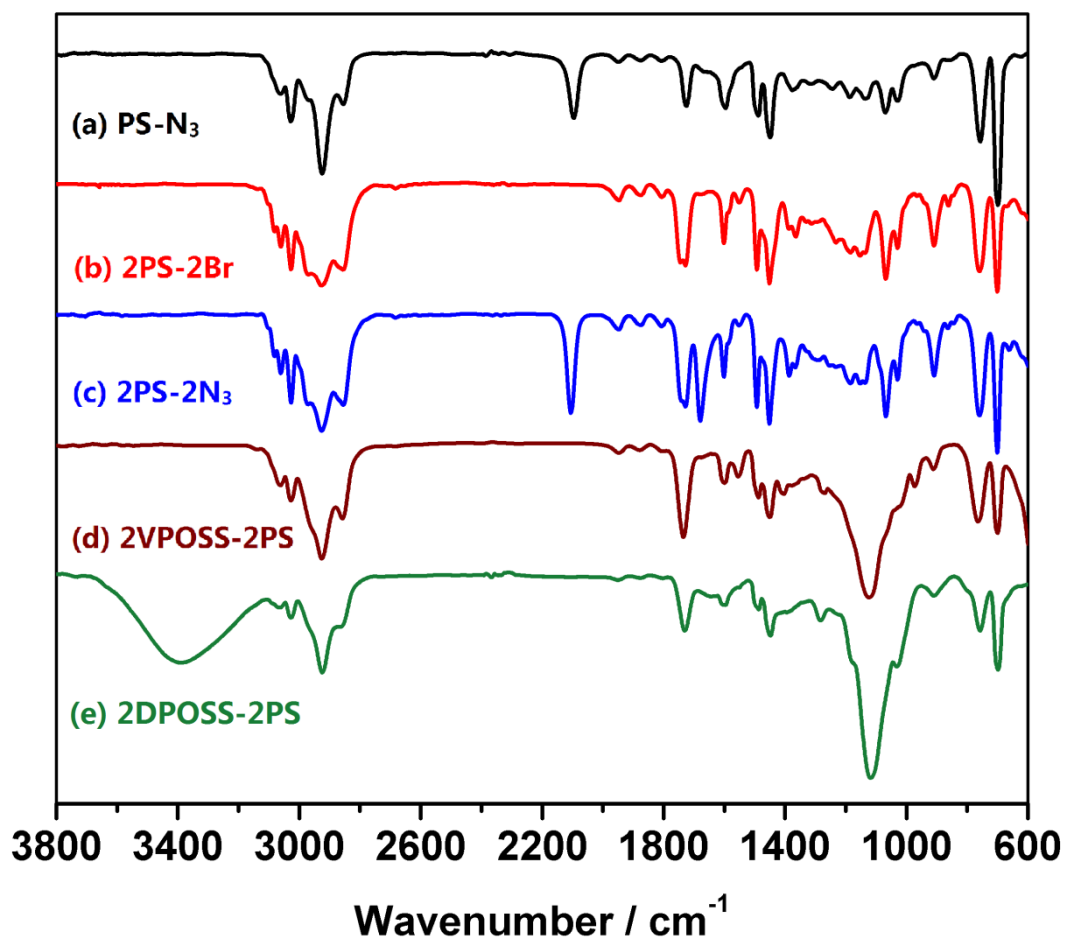
**Figure S4.** FT-IR spectra of (a) N<sub>3</sub>-PS-N<sub>3</sub> (black curve), (b) VPOSS-PS-VPOSS (brown curve), and (c) DPOSS-PS-DPOSS (green curve).



**Figure S5.** MALDI-TOF MS spectrum of VPOSS-PS-VPOSS obtained in reflection mode with isotopic resolution. The inset shows the full spectrum.

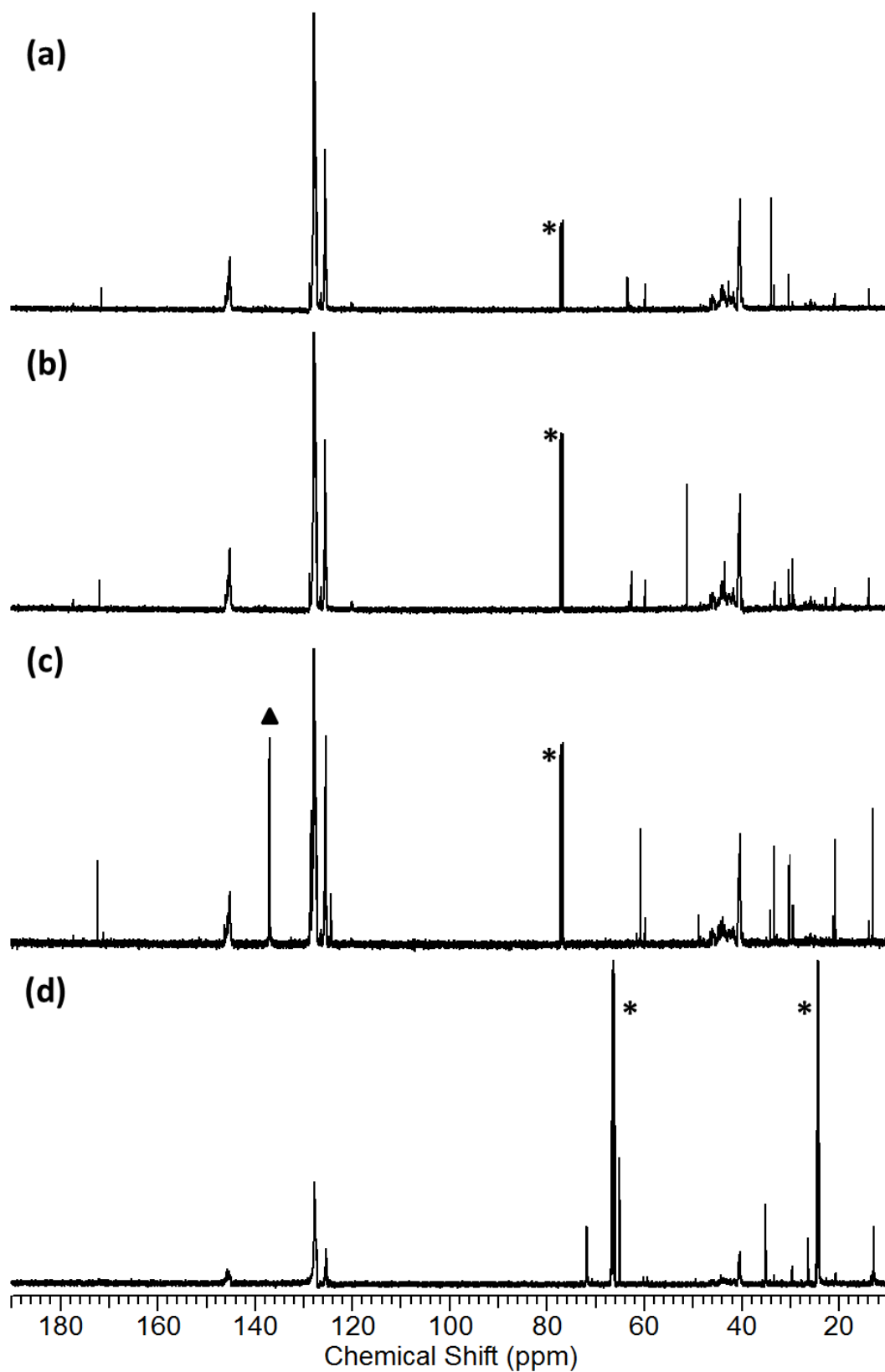


**Figure S6.**  $^{13}\text{C}$  NMR spectra of (a) 2PS-2Br, (b) 2PS-2N<sub>3</sub>, (c) 2VPOSS-2PS, and (d) 2DPOSS-2PS. The asterisks indicate the resonance peaks from the solvent carbons and the triangle denotes the peaks from vinyl carbons.

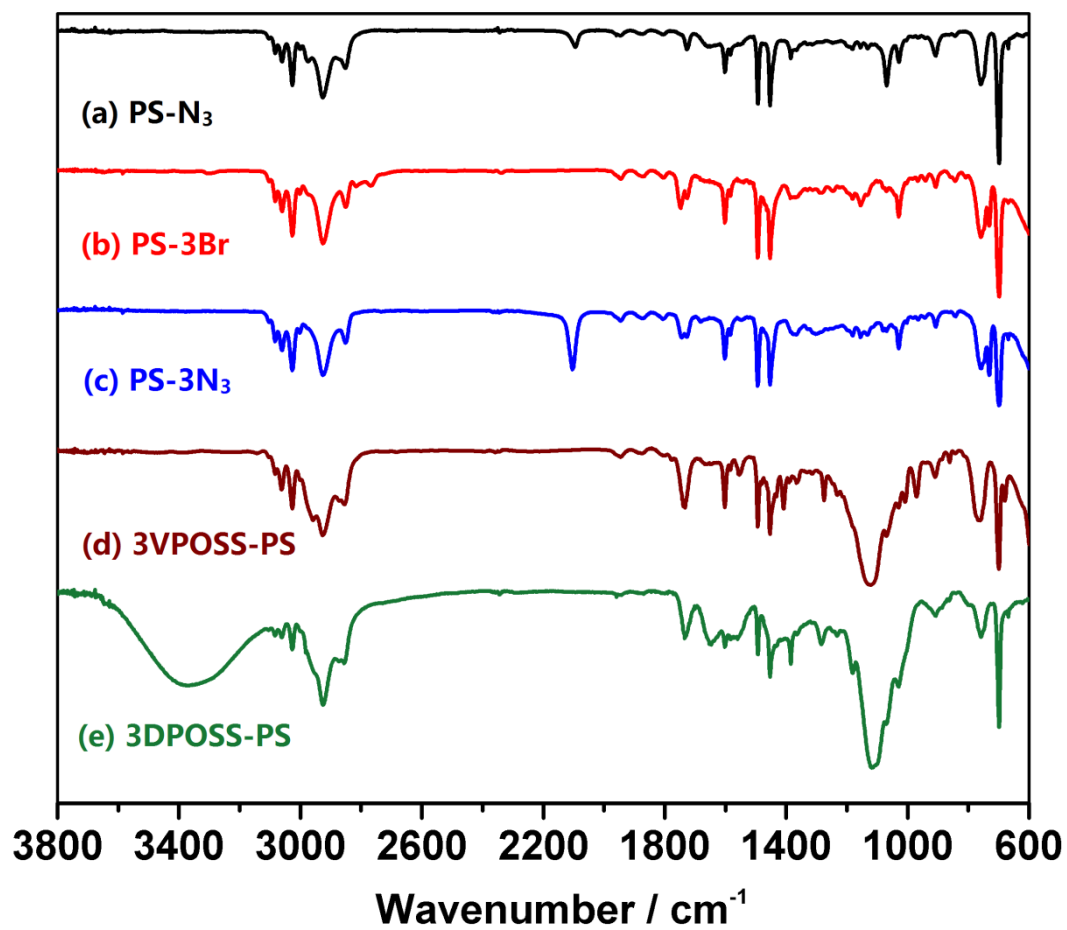


**Figure S7.** FT-IR spectra of (a) PS- $\text{N}_3$  (black curve), (b) 2PS-2Br (red curve), (c) 2PS-2 $\text{N}_3$  (blue curve), (d) 2VPOSS-2PS (brown curve), and (e) 2DPOSS-2PS (green curve).





**Figure S8.**  $^{13}\text{C}$  NMR spectra of (a) PS-3Br, (b) PS-3N<sub>3</sub>, (c) 3VPOSS-PS, and (d) 3DPOSS-PS. The asterisks indicate the resonance peaks from the solvent carbons and the triangle denotes the peaks from vinyl carbons.



**Figure S9.** FT-IR spectra of (a) PS-N<sub>3</sub> (black curve), (b) PS-3Br (red curve), (c) PS-3N<sub>3</sub> (blue curve), (d) 3VPOSS-PS (brown curve), and (e) 3DPOSS-PS (green curve).