**Supporting Information for:**

# *Low-Field $^1$H Nuclear Magnetic Resonance Spectroscopy for Compositional Analysis of Multicomponent Polymer Systems*

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## 1. Studied Polymer Structures

The chemical structures of the four polymers examined in this work are shown in Figure S1.

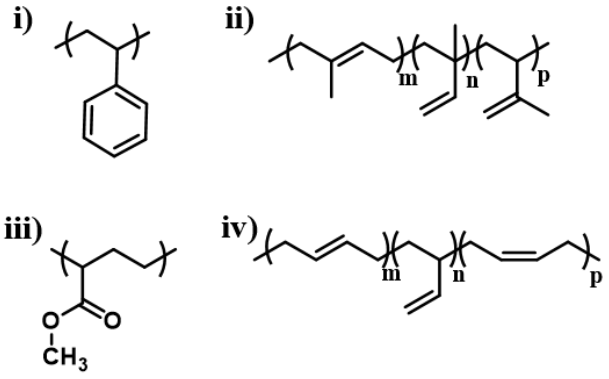


**Figure S1.** Chemical structures of i) polystyrene, ii) polyisoprene, iii) poly(methyl methacrylate), and iv) polybutadiene. Note these are the homopolymer structures and in the case of SBS and SIS serve as the block structure within the overall block copolymer.

## 2.Symmetric Triblock Compositional Analysis

$^1$H NMR spectra of the SBS triblock copolymer acquired using both a 400 MHz and a 60 MHz spectrometer are shown in Figure S2.

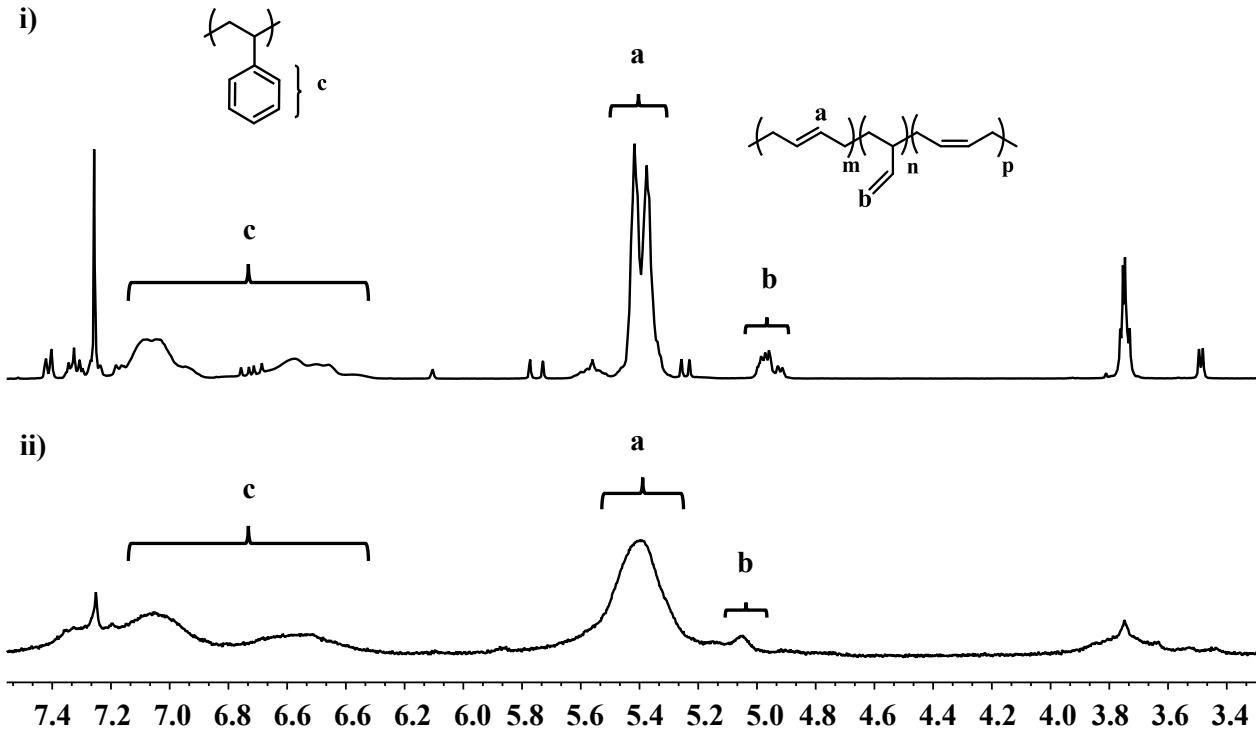


**Figure S2.** $^1$H NMR spectra of SBS triblock copolymer at i) 400 MHz and ii) 60 MHz.

The composition of SBS was determined using the same process as the SIS (Equation 6) using Equation S1 and the PB microstructure (1,2- and 1,4-content) was determined the same process as the PI microstructure (Equations 4 and 5) using Equations S2 and S3 below.[1,2]

*Equation S1*
$$\%S(in\,SBS) = 100 * \frac{\frac{I_7}{5}}{I_{5.4} + I_{5.6} + \frac{I_7}{5}}$$

*Equation S2*
$$\%1,2\ (= CH_2) = 100 * \frac{I_{5.6}}{I_{5.4} + I_{5.6}}$$

*Equation S3:*
$$\%1,4\ (= CH-) = 100 * \frac{I_{5.4}}{I_{5.4} + I_{5.6}}$$

## 2. Polymer Blend Compositional Analysis

For PS/PI polymer blends the composition was determined using the same process as the SIS triblock copolymer (Equation 6). For PS/PMMA polymer blends the composition is determined using Equation S4.[3]

*Equation S4:*

$$\%S(in\,PS/PMMA) = 100 * \frac{\frac{I_7}{5}}{\frac{I_{3.9}}{3} + \frac{I_7}{5}}$$

$^1$H NMR spectra for each of the PS/PI and PS/PMMA polymer blends at both 400 MHz and 60 MHz are shown in Figures S3 and S4 respectively.

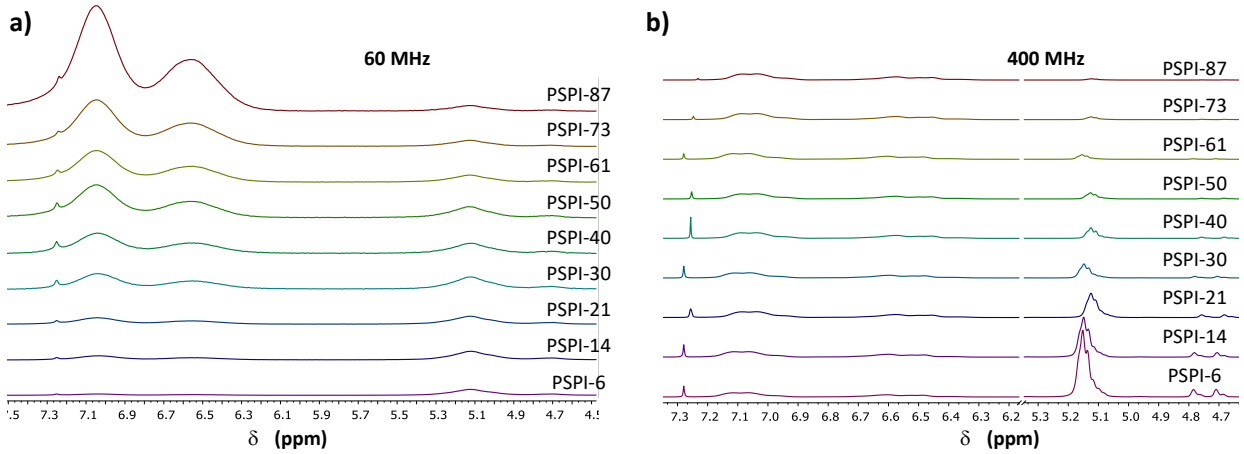


**Figure S3.** $^1$H NMR spectra of PS/PI polymer blends at varied relative composition at a) 60 MHz and b) 400 MHz where each spectrum is named according to the PS content determined using the 400 MHz spectra for that blend.

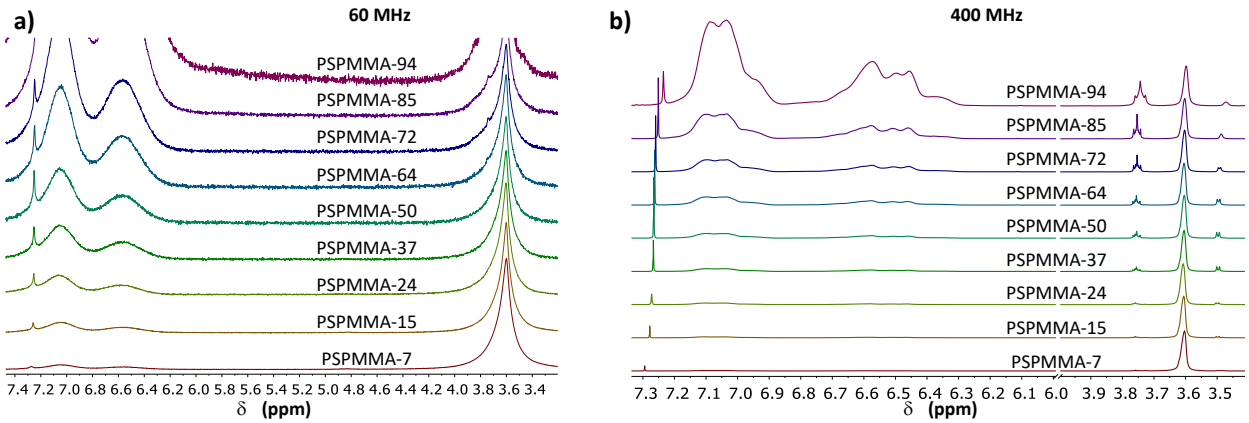


**Figure S4.** $^{1}$H NMR spectra of PS/PMMA polymer blends at varied relative composition at a) 400 MHz and b) 60 MHz. where each spectra is named according to the PS content determined using the 400 MHz spectra for that blend.

**Table S1.** Composition extracted from analysis of each spectra for both PS/PI and PS/PMMA blends.

| Sample | Frequency | Mole % Polystyrene | Sample | Frequency | Mole % Polystyrene |
|---|---|---|---|---|---|
| PSPI-6 | 60 MHz | 5.4 | PSPMMA-7 | 60 MHz | 6.5 |
| | 400 MHz | 5.6 | | 400 MHz | 6.6 |
| PSPI-14 | 60 MHz | 13.2 | PSPMMA-15 | 60 MHz | 15.0 |
| | 400 MHz | 13.5 | | 400 MHz | 15.1 |
| PSPI-21 | 60 MHz | 20.6 | PSPMMA-24 | 60 MHz | 23.9 |
| | 400 MHz | 20.9 | | 400 MHz | 24.3 |
| PSPI-30 | 60 MHz | 29.6 | PSPMMA-37 | 60 MHz | 39.2 |
| | 400 MHz | 29.7 | | 400 MHz | 37.0 |
| PSPI-40 | 60 MHz | 40.0 | PSPMMA-50 | 60 MHz | 49.4 |
| | 400 MHz | 39.6 | | 400 MHz | 49.1 |
| PSPI-50 | 60 MHz | 48.6 | PSPMMA-64 | 60 MHz | 64.1 |
| | 400 MHz | 50.2 | | 400 MHz | 63.2 |
| PSPI-61 | 60 MHz | 60.7 | PSPMMA-72 | 60 MHz | 72.4 |
| | 400 MHz | 61.2 | | 400 MHz | 72.0 |
| PSPI-73 | 60 MHz | 72.6 | PSPMMA-85 | 60 MHz | 86.0 |
| | 400 MHz | 72.9 | | 400 MHz | 85.2 |
| PSPI-87 | 60 MHz | 86.4 | PSPMMA-94 | 60 MHz | 93.4 |
| | 400 MHz | 86.8 | | 400 MHz | 94.2 |

**References Cited**


(1) Tanaka, Y.; Takeuchi, Y.; Kobayashi, M.; Tadokoro, H. *Journal of Polymer Science Part B: Polymer Physics* **1971**, *9* (1), 43–57.

(2) Santee, E. R.; Chang, R.; Morton, M. *Journal of Polymer Science Part C: Polymer Letters* **1973**, *11* (7), 449–452.

(3) Nagai, M.; Nishioka, A. *J Polym Sci A-1* **1968**, *6* (6), 1655–1660.