Designer Stabilizer for Preparation of Pristine Graphene/Polysiloxane Films and Networks

Dorsa Parviz, Ziniu Yu, Ronald C. Hedden,* Micah J. Green**

Department of Chemical Engineering, Texas Tech University, Lubbock, Texas 79409, USA

+Current address: Department of Chemical Engineering, Texas A&M University, College Station, TX 77843, USA

*corresponding author (polymer synthesis): ronald.hedden@ttu.edu

**corresponding author (graphene nanomaterials): micah.green@tamu.edu

Supporting Information

Figure S1. FT-IR spectra of fraction 4 of the PMPyS sample.
Figure S2. UV-vis spectra of the polymer precursors and PMPyS fractions.

Table S1. Pyrene content of different PMPyS fractions (based on the area under UV-vis spectra of each fraction)

<table>
<thead>
<tr>
<th>Fraction 1</th>
<th>Fraction 2</th>
<th>Fraction 3</th>
<th>Fraction 4</th>
<th>Fraction 5</th>
<th>Fraction 6</th>
<th>Fraction 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyrene content (wt%)</td>
<td>8.43</td>
<td>9.57</td>
<td>16.85</td>
<td>8.86</td>
<td>12.91</td>
<td>13.89</td>
</tr>
</tbody>
</table>
Figure S3. (a) and (c) Additional TEM images of the graphene sheets in the dispersion obtained from fraction 3 of the PMPyS polymers; inset is the graphene dispersion prepared by fraction 3 of PMPyS, (b) and (d) the edge of the same graphene sheets which shows the few-layer nature of the PDMS-stabilized graphene in the dispersion.
Figure S4. DSC heating traces for fractions 2 and 6 of PMPyS and PMPyS-G samples.
Figure S5. Raman Spectrum of PMPyS-G (fraction 4).

The Raman spectrum was measured on a Renishaw Raman microscope using a 633 nm He-Ne laser. To prepare the sample, the dispersion of PMPyS-G (fraction 4) in chloroform was cast on a filtration membrane. The spectrum shows two main peaks at ~1580 and 2680 cm\(^{-1}\) corresponding to the G and 2D bands. The G band represents the sp\(^2\)-hybridized carbon bonds and 2D band is the characteristic band which shows the thickness of the graphene sheets.