A self-curing triphenol A-based phthalonitrile resin precursor acts as flexibilizer and curing agent for phthalonitrile resin

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Table 1S. The reactions conditions for preparing TPPA-Ph precursors.

Figure 1S. LC-MS of TPPA-Ph precursor and molecular ion peaks in negative mode of products.

Figure 2S. Conversion α as a function of temperature for TPPA-Ph (P4) at various heating rates.

Figure 3S. Starink plots at various degrees of conversion for TPPA-Ph (P4).

Figure 4S. Variation of $E_\alpha$ versus α for TPPA-Ph (P4) (Starink method).

Scheme 1S. Synthesis of resorcinol-based phthalonitrile resin precursor (DPPH).

Figure 5S. $^1$H NMR spectrum of DPPH.

Table 1S. The reactions conditions for preparing TPPA-Ph precursors.
<table>
<thead>
<tr>
<th>TPPA-Ph precursors</th>
<th>The molar ratio of TPPA : K$_2$CO$_3$ : NPh</th>
<th>Reaction temperature (°C)</th>
<th>Reaction time (h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>1:2.5:3.2</td>
<td>80</td>
<td>24</td>
</tr>
<tr>
<td>P2</td>
<td>1:1.5:3.1</td>
<td>25</td>
<td>24</td>
</tr>
<tr>
<td>P3</td>
<td>1:1.5:2.05</td>
<td>25</td>
<td>24</td>
</tr>
<tr>
<td>P4</td>
<td>1:1.5:1.05</td>
<td>25</td>
<td>24</td>
</tr>
</tbody>
</table>

**Figure 1S.** LC-MS of TPPA-Ph (P2) and molecular ion peaks in negative mode of products.
**Figure 2S.** Conversion $\alpha$ as a function of temperature for TPPA-Ph (P4) at various heating rates.

**Figure 3S.** Starink plots at various degrees of conversion for TPPA-Ph (P4).
**Figure 4S.** Variation of $E\alpha$ versus $\alpha$ for TPPA-Ph (P4) (Starink method).

**Scheme 1S.** Synthesis of resorcinol-based phthalonitrile resin precursor (DPPH).

**Figure 5S.** $^1$H NMR spectrum of DPPH.