Supplemental Information

Nanoreactors for the non-enzymatic introduction of ortho or para-hydroxyl groups to aromatic molecules.

M. Bahrami,1,2 X. Zhang,2,3 M. Ehsani,1 Y. Jahani,1 R.M. Laine2*

1Department of Polymer Processing, Iran Polymer and Petrochemical Institute, 14965/115, Tehran, Iran.
2Macromolecular Science and Engineering, and Materials Science and Engineering, University of Michigan, Ann Arbor, MI 48109-2136,
3Department of Chemistry, Harbin Institute of Technology, Harbin 150001, China.
E-mail: talsdad@umich.edu; Tel: +1 734 764-6203

Table S1. GC data for cleavage of different Ortho, Meta, and Para derivatives of PhSQs.

<table>
<thead>
<tr>
<th>GC of cleavage of [RStyrPhSiO_{1.5}]_x (X=8,10,12)</th>
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<tbody>
<tr>
<td><img src="image" alt="GC data for cleavage of different Ortho, Meta, and Para derivatives of PhSQs." /></td>
</tr>
<tr>
<td><img src="image" alt="Diagrams of different derivatives" /></td>
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\[ [p\text{-}I\text{PhSiO}_{1.5}]_{12} \]

\[ [p\text{-}\text{MeStyrPhSiO}_{1.5}]_{12} \]

\[ [p\text{-}\text{cyanoStyrPhSiO}_{1.5}]_{12} \]

\[ [p\text{-}\text{MeStyr_7Ph_8Si_8O}_{12}] \]

\[ F^{-}\text{cleaved} \]

\[ [m\text{-AcetylPhSiO}_{1.5}]_{8} \]

\[ [m\text{-NitroPhSiO}_{1.5}]_{8} \]
Figure S1. Mass spec of peroxide cleavage of [BrPhSiO$_{1.5}$]$_8$ residence time 5.4 min.

Figure S2. Mass spec of peroxide cleavage of [BrPhSiO$_{1.5}$]$_8$ residence time 7.1 min.

Figure S3. Mass spec of peroxide cleavage of [BrPhSiO$_{1.5}$]$_{10}$ residence time 5.4 min.

Figure S4. Mass spec of peroxide cleavage of [BrPhSiO$_{1.5}$]$_{10}$ residence time 7.1 min.
Figure S5. Mass spec of peroxide cleavage of [\text{o-MeStyr}_7\text{Ph}_8\text{Si}_8\text{O}_{12}] for peak with R = 10.8 min.

Figure S6. Mass spec of peroxide cleavage of [\text{p-MeStyr}_7\text{Ph}_8\text{Si}_8\text{O}_{12}] for peak with R = 11.3 min.

Figure S7. MALDI of mixture of [\text{o-cyanoStyr}_7\text{Ph}_8\text{Si}_8\text{O}_{12}] + Ag m/z = 1906, [\text{o-cyanoStyr}_7\text{Ph}_8\text{Si}_8\text{O}_{12}] + Ag m/z = 2032 and [\text{o-cyanoStyrPhSiO}_{1.5}] + Ag parent m/z = 2158.

Figure S8. Mass spec of peroxide cleavage of [\text{o-cyanoStyr}_7\text{Ph}_8\text{Si}_8\text{O}_{12}] + Ag m/z = 1906, residence time 12 min 4-cyano-2'-OH-stilbene.
Figure S9. MALDI of \( [p\text{-IPhSiO}_{1.5}]_{12} + \text{Ag} \). Cal mass spec m/z = 3168.9,
Experimental m/z = 3168.1.

Figure S10. Mass spec of peroxide cleavage of \( [\text{IPhSiO}_{1.5}]_{12} \) residence time 6.4 m.

Figure S11. Mass spec of peroxide cleavage of \( [\text{IPhSiO}_{1.5}]_{12} \) residence time 7.8 m.
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**Figure S14.** FT-IR of peroxide cleavage of $[p\text{-IPhSiO}_{1.5}]_{12}$.

**Figure S15.** FTIR of OPS (blue) and OAcPS (red).
Figure S16. FT-IR of a pure sample of 4-iodophenol.

Figure S17. Mass spec of peroxide cleavage of \([p-{\text{MeStyr}PhSiO_{1.5}}]_{12}\) residence time 10.6 min suggesting an epoxidized derivative.

Figure S18. Mass spec of 4,4’- Me,OH-stilbene with a residence time 11.2 min.

Figure S19. Mass spec of F- cleaved \([p-{\text{MeStyr}}_{7}\text{Ph}_{8}\text{Si}_{6}\text{O}_{12}]\) time R=8.7 min.
Figure S20. Mass spec of F- cleaved [α-MeStyr₇Ph₈Si₈O₁₂] residence time 9.7 min.

Figure S21. Mass spec of peroxide cleavage of [p-cyanoStyrPhSiO₁₂] residence time 12.5 min.

Figure S22. Mass spec peroxide cleavage of [p-cyanoStyrPhSiO₁₂] residence time 12.8 min.

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Figure S26. Mass spec peroxide cleavage of $[m\text{-NitroPhSiO}_{1.5}]_8$, residence time 8.7 min.

Figure S27. Mass spec peroxide cleavage of $[m\text{-NitroPhSiO}_{1.5}]_8$, residence time 9 min.

Figure S28. H-NMR of $[m\text{-(4-toluenesulfonyl)PhSiO}_{1.5}]_8$. 
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Figure S30. Mass spec peroxide cleavage of $[m$-(4-toluenesulfonyl)PhSiO$_{1.5}]_8$ residence time 12.8 min.

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Figure S33. Predicted $^{13}$C-NMR of 4,2'-Me,OH-stilbene.
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Figure S35. Blow up of $^1$H-NMR of o-phenol derivative of [o-cyanostilbeneSiO$_{1.5}$]$_7$[PhSiO$_{1.5}$].
**Figure S36.** Blow up of predicted $^1$H-NMR of $o$-phenol derivative of [o-cyanostilbeneSiO$_{1.5}$]$_7$[PhSiO$_{1.5}$].

**Figure S37.** The $^{13}$C-NMR of $o$-phenol derivative of [o-cyanostilbene-SiO$_{1.5}$]$_7$[PhSiO$_{1.5}$].
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**Figure S45.** Blow up of predicted $^1$H-NMR of $p$-cyanophenol from $[p$-cyanostilbene-$\text{SiO}_{1.5}]_{12}$. 