Electronic Supporting Information for

BODIPY Based Hyperbranched Conjugated Polymers for Detecting Organic Vapors

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1. $^1$H and $^{13}$C NMR and mass spectra of monomers

Figure S1. $^1$H NMR spectrum of tris-(4-iodophenyl)amine in CDCl$_3$.

Figure S2. $^1$H NMR spectrum of compound 2 in CDCl$_3$. 
Figure S3. $^{13}$C NMR spectrum of compound 2 in CDCl$_3$. 
Figure S4. High resolution atmospheric-pressure chemical ionization mass spectrum of compound 2.
2. $^1$H NMR spectra of HP1-HP3

Figure S5. $^1$H NMR spectrum of HP1 in CDCl$_3$. 
Figure S6. $^1$H NMR spectrum of HP2 in CDCl$_3$.

Figure S7. $^1$H NMR spectrum of HP3 in CDCl$_3$. 
3. BET analysis of HP1-3

<table>
<thead>
<tr>
<th>Surface Area (m²/g)</th>
<th>Pore Size (nm)</th>
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<tr>
<td>HP1 362.21</td>
<td>11.03</td>
</tr>
<tr>
<td>HP2 513.67</td>
<td>16.54</td>
</tr>
<tr>
<td>HP3 259.03</td>
<td>12.41</td>
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</tbody>
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Figure S8. Nitrogen sorption isotherms of HP1-3 with adsorption (solid symbols) and desorption (open symbols) traces at 77 K.

4. Absorption and emission spectra

Figure S9. Absorption spectrum of compound 2 in THF.
Figure S10. Absorption (left) and emission spectra (right) of HP1-HP3 in chloroform.
5. Optimized molecular geometry of HP2 by DFT

Figure S11. The optimized molecular geometry of HP2 by using DFT at B3LYP/6-311g (d, p) level. Top view (a) and side view (b) of HP2 model molecule, dihedral angles of the tris(4-(5-bromo-3-hexylthiophen-2-yl)phenyl)amine (c), and dihedral angles of the tris(4-(5-bromo-thiophen-2-yl)phenyl)amine (d).
Figure S12. SEM micrographs of HP1-3 thin film prepared by drop-casting polymer solution in (a) THF, and (b) toluene on a glass substrate. The solvent was evaporated slowly at room temperature.
7. QCM measurement of HP2 to different aromatic vapors.

Figure S13. (a) QCM frequency shifts of HP2 electrode upon exposure to different solvent vapors (benzene, toluene, o-xylene, m-xylene, p-xylene, and mesitylene), (b) summary of vapor sensing performance of HP2.