Poly(phenylacetylene)s with Pendant Sulfonamide Receptors for Anion Detection

**Significance:** Development of colorimetric sensors capable of detecting anions in aqueous medium is of great interest. In this paper, the authors describe the synthesis of a series of poly(phenylacetylene)s baring pendant sulfonamide side chains. The sulfonamide moiety is demonstrated to act as an anion receptor via a deprotonation mechanism, allowing sensing of anions in aqueous environment.

**Comment:** In this paper, the authors report a two-step protocol leading to a series of poly(phenylacetylene)s containing pendant sulfonamide moieties with electron-withdrawing or electron-donating substituents (2a–f). The obtained polymers showed varied PDIs (see Table above) in agreement with known rhodium-catalyzed polymerizations of acetylenes. They furthermore demonstrate the utility of these polymers as anion sensors. 2b showed clear red-shifted absorption upon addition of fluoride in mixed solvents with 20% water content.

**Table:**

<table>
<thead>
<tr>
<th>R</th>
<th>Yield</th>
<th>R</th>
<th>Yield</th>
<th>Mn × 10^{-5}</th>
<th>PDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>90%</td>
<td>2a</td>
<td>86%</td>
<td>0.9</td>
<td>1.97</td>
</tr>
<tr>
<td>1b</td>
<td>87%</td>
<td>2b</td>
<td>68%</td>
<td>4.77</td>
<td>5.65</td>
</tr>
<tr>
<td>1c</td>
<td>92%</td>
<td>2c</td>
<td>84%</td>
<td>2.44</td>
<td>3.54</td>
</tr>
<tr>
<td>1d</td>
<td>95%</td>
<td>2d</td>
<td>85%</td>
<td>2.91</td>
<td>2.57</td>
</tr>
<tr>
<td>1e</td>
<td>88%</td>
<td>2e</td>
<td>81%</td>
<td>1.2</td>
<td>3.33</td>
</tr>
<tr>
<td>1f</td>
<td>72%</td>
<td>2f</td>
<td>82%</td>
<td>1.64</td>
<td>4.99</td>
</tr>
</tbody>
</table>

**Equation:**

\[
\begin{align*}
\text{R} & \quad \text{Yield} \\
1a & \quad 90\% \\
1b & \quad 87\% \\
1c & \quad 92\% \\
1d & \quad 95\% \\
1e & \quad 88\% \\
1f & \quad 72\% \\
2a & \quad 86\% \\
2b & \quad 68\% \\
2c & \quad 84\% \\
2d & \quad 85\% \\
2e & \quad 81\% \\
2f & \quad 82\% \\
\end{align*}
\]