Synthesis and Characterization of a Novel Kind of Near-Infrared Electrochromic Polymers Containing Anthraquinone Imide Group and Ionic Moieties

Yijun Zheng, Jia Zheng, Letian Dou, Wenqiang Qiao, Xinhua Wan

Table S1: Solubility of the polymers

<table>
<thead>
<tr>
<th>Polymers</th>
<th>DMF</th>
<th>DMSO</th>
<th>NMP</th>
<th>DMAc</th>
<th>CH₂OH</th>
<th>H₂O</th>
<th>MeEtIm⁺Br⁻</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>++</td>
<td>++</td>
<td>+</td>
<td>++</td>
<td>-</td>
<td>-</td>
<td>±</td>
</tr>
<tr>
<td>1b</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>1c</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>+</td>
</tr>
</tbody>
</table>

a The qualitative solubility was tested with 1 mg of a sample in 1 mL of stirred solvent. ++, soluble at room temperature; +, soluble on heating; ±, partially soluble; -, insoluble even on heating.

Figure S1: UV-vis calibration curves for determining the AQI content in copolymers

Figure S2: UV-vis calibration curves for determining the poly(ionic liquid) content in copolymers
Figure S3: UV-vis curve of the copolymers
0.09 mg/mL in DMSO for 1c
0.12 mg/mL in DMSO for 1b

Figure S4: GPC traces of the polymers (c = 10 mg/mL in DMF)

Figure S5: TGA traces of the polymers

Figure S6: Cyclic voltammograms of polymer 1b in DMF and in film, potentials vs Ag/AgCl.
Figure S7: Cyclic voltammograms of polymer 1c in DMF and in film, potentials vs Ag/AgCl.

Figure S8: UV-vis-NIR spectra of polymer 1b in DMF ($5 \times 10^{-3}$ M) containing TBAP in its neutral, anionic, and dianionic states.

Figure S9: UV-vis-NIR spectra of polymer 1b in film. (THF containing 0.1 M TBAP)

Figure S10: UV-vis-NIR spectra of polymer 1c in DMF ($5 \times 10^{-3}$ M) containing TBAP in its neutral, anionic, and dianionic states.

Figure S11: UV-vis-NIR spectra of polymer 1c in film. (THF containing 0.1 M TBAP)
Figure S12: Optical attenuation of film of polymer 1a at 540 nm on ITO glass as a function of applied potential with a switching time of 20 seconds and a stepping potential (0.4 V vs silver electrode).