Supporting Information

Polymer Chemistry manuscript
‘Hydrophobic polypyrrole synthesized by aqueous chemical oxidative polymerization and its use as a light-responsive liquid marble stabilizer’
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Figure S1 Laser diffraction particle size distribution curves obtained for (a) PPy-C8F, (b) PPy-C6F, (c) PPy-C4F, (d) PPy-Cl and (e) dedoped PPy-C8F dispersed in aqueous medium.
Figure S2. Digital images of (a) PPy-C8F, (b) PPy-C6F, (c) PPy-C4F and (d) PPy-Cl dried bulk powders.
Figure S3. FT-IR spectra of (a) C8F dopant, (b) PPy-C8F and (c) PPy-Cl. The typical absorption bands for C8F due to the vibrations of the –CF$_3$ and –CF$_2$– groups were observed in the spectrum of PPy-C8F as peaks and shoulders. (Lin-Vien, D. The Handbook of Infrared and Raman Characteristic Frequencies of Organic Molecules. Academic Press: San Diego, 1991.)
Figure S4. TG curves of (a) PPy-C8F, (b) PPy-Cl and (c) dedoped PPy-C8F bulk powders.
Figure S5. Diameter of the contact area, height and width of LMs placed on a glass substrate containing various volumes of water. The solid curve indicates the theoretical behavior under the assumption that water droplets have a perfectly spherical morphology independent of water volume.

Surface tension

\[ a = 2 \left( \frac{\gamma_{LV}}{\rho g} \right) \]

\[ \kappa_{LV} = \frac{a^2}{4} \rho g \]

\[ \gamma_{LV} = 52.5 \text{ mN/m} \]

Capillary length

\[ \kappa^{-1} = \frac{\gamma_{LV}}{\sqrt{\rho g}} \]

\[ \kappa^{-1} = 0.23 \text{ cm} \]

\( a \): Diameter of height

\( \rho \): Density

\( g \): Gravitational acceleration

\( \gamma_{LV} \): Surface tension

\( \kappa^{-1} \): Capillary length
Table S1  Synthesis of PPy materials by aqueous chemical oxidative polymerization\textsuperscript{a)}

<table>
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<tr>
<th>Ingredients</th>
<th>(g)</th>
<th>1</th>
<th>1</th>
<th>1</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyrrole\textsuperscript{b, c)}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heptadecafluorooctane sulfonic acid\textsuperscript{b)}</td>
<td>(g)</td>
<td>2.5</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Tridecafluorohexane-1-sulfonic acid\textsuperscript{b)}</td>
<td>(g)</td>
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<td>2.2</td>
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<td>-</td>
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<tr>
<td>Nonadecafluoro-1-butane sulfonic acid\textsuperscript{b)}</td>
<td>(g)</td>
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<td>-</td>
<td>1.5</td>
<td>-</td>
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<tr>
<td>FeCl\textsubscript{3}•6H\textsubscript{2}O\textsuperscript{c)}</td>
<td>(g)</td>
<td>9.4</td>
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<tr>
<td>Water</td>
<td>(g)</td>
<td>103.8</td>
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<td>100</td>
</tr>
</tbody>
</table>

\textsuperscript{a)} 25 °C, 24 h, 500 rpm (magnetic stirring)
\textsuperscript{b)} Pyrrole/dopant, 3/1 (molar ratio)
\textsuperscript{c)} Pyrrole/FeCl\textsubscript{3}, 3/7 (molar ratio)