Supporting information

Semitransparent superoleophobic coatings with low sliding angles for hot liquids based on silica nanotubes

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Fig. S1. TEM images of acid activated MWCNTs.

Fig. S2. Images of M-MWCNTs and M-MWCNTs@PDMS in n-hexane. $C_{\text{M-MWCNTs}} = 1.0 \text{ mg/mL}$ and $C_{\text{PDMS}} = 1.0 \text{ mg/mL}$ in the suspension of M-MWCNTs@PDMS.
Table S1. Surface chemical composition of M-MWCNTs@PDMS, SNTs and SNTs@PFDTCS coatings. $D_{\text{MWCNTs}} = 50$ nm, $C_{\text{M-MWCNTs}} = 1.0$ mg/mL and $C_{\text{PDMS}} = 1.0$ mg/mL.

<table>
<thead>
<tr>
<th>Atomic (%)</th>
<th>Coatings</th>
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<tbody>
<tr>
<td></td>
<td>M-MWCNTs@PDMS</td>
<td>SNTs</td>
<td>SNTs@PFDTCS</td>
</tr>
<tr>
<td>C</td>
<td>56.37</td>
<td>16.88</td>
<td>26.89</td>
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<tr>
<td>O</td>
<td>24.37</td>
<td>54.75</td>
<td>13.57</td>
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<tr>
<td>Si</td>
<td>19.26</td>
<td>28.37</td>
<td>9.67</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
<td>0</td>
<td>49.88</td>
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</tbody>
</table>

Fig. S3. (a) EDS elemental maps of C, Si and F in the SNTs@PFDTCS coating. $D_{\text{MWCNTs}} = 50$ nm, $C_{\text{M-MWCNTs}} = 1.0$ mg/mL and $C_{\text{PDMS}} = 1.0$ mg/mL.

Fig. S4. EDS spectrum of the SNTs@PFDTCS coating. $D_{\text{MWCNTs}} = 50$ nm, $C_{\text{M-MWCNTs}} = 1.0$ mg/mL and $C_{\text{PDMS}} = 1.0$ mg/mL.
Fig. S5. SEM images of the SNTs@PFDTCS coatings prepared with a $D_{\text{MWCNTs}}$ of (a, b) 15 nm, (c, d) 30 nm, (e, f) 50 nm and (g, h) 80 nm. $C_{\text{M-MWCNTs}} = 1.0\ \text{mg/mL}$ and $C_{\text{PDMS}} = 1.0\ \text{mg/mL}$. 
Fig. S6. Variation of transmittance of the (a) SNTs-coated glass slides and (b) SNTs@PFDTCS-coated glass slides with $D_{\text{MWCNTs}}$. $C_{\text{M-MWCNTs}} = 1.0 \text{ mg/mL}$ and $C_{\text{PDMS}} = 1.0 \text{ mg/mL}$.

Fig. S7. (a) Variation of CA$_{n\text{-decane}}$ and SA$_{n\text{-decane}}$ of the SNTs@PFDTCS coatings with spray-coating density of M-MWCNTs@PDMS on glass slides and (b) variation of transmittance of the SNTs- and SNTs@PFDTCS-coated glass slides at 600 nm with spray-coating density of M-MWCNTs@PDMS on glass slides. $D_{\text{MWCNTs}} = 50 \text{ nm}$, $C_{\text{M-MWCNTs}} = 1.0 \text{ mg/mL}$ and $C_{\text{PDMS}} = 1.0 \text{ mg/mL}$.

Movie S1. Slide of various liquid droplets off the tilted SNTs@PFDTCS coating. $D_{\text{MWCNTs}} = 50 \text{ nm}$, $C_{\text{M-MWCNTs}} = 1.0 \text{ mg/mL}$ and $C_{\text{PDMS}} = 1.0 \text{ mg/mL}$. This video highlights the excellent superoleophobicity of the coating.

Movie S2. Removal of sand microparticles on the SNTs@PFDTCS coating using $n$-hexadecane. $D_{\text{MWCNTs}} = 50 \text{ nm}$, $C_{\text{M-MWCNTs}} = 1.0 \text{ mg/mL}$ and $C_{\text{PDMS}} = 1.0 \text{ mg/mL}$. This video highlights the self-cleaning property of the coating using organic liquid.

Movie S3. Slide of hot water and $n$-hexadecane droplets off the tilted SNTs@PFDTCS coating. $D_{\text{MWCNTs}} = 50 \text{ nm}$, $C_{\text{M-MWCNTs}} = 1.0 \text{ mg/mL}$ and $C_{\text{PDMS}} = 1.0 \text{ mg/mL}$. This video highlights the excellent superoleophobicity of the coating for hot liquids.