Supporting Information

VO₂ nanorods for efficient performance in thermal fluids and sensors

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S1. Plots representing the actual ratio $K_{nf}/K_{EG}$ ($K_{nf}$ is the thermal conductivity of the nanofluid and $K_{EG}$ being thermal conductivity of the base fluid) across the entire experimental temperature range of 20 to 80 °C.

**Fig. S1.** Thermal conductivity ratios for the VO$_2$ (B)/EG nanofluids for different volume percent of VO$_2$. $K_{nf}$ = thermal conductivity of the nanofluid, $K_{EG}$ = thermal conductivity of ethylene glycol.
S2. Table representing comparison of VO₂ sensor performance towards different gases

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Sensing material</th>
<th>Target gas</th>
<th>Operating temperature</th>
<th>% sensor response</th>
<th>Response time</th>
<th>Recovery time</th>
<th>Reference number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VO₂</td>
<td>ethanol</td>
<td>300 °C</td>
<td>8%</td>
<td>---</td>
<td>---</td>
<td>[1]</td>
</tr>
<tr>
<td>2</td>
<td>VO₂</td>
<td>hydrogen</td>
<td>room temperature</td>
<td>19%</td>
<td>890 s</td>
<td>870 s</td>
<td>[2]</td>
</tr>
<tr>
<td>3</td>
<td>VO₂</td>
<td>carbon dioxide</td>
<td>170 °C</td>
<td>10%</td>
<td>--</td>
<td>--</td>
<td>[2]</td>
</tr>
<tr>
<td>4</td>
<td>VO₂</td>
<td>LPG</td>
<td>room temperature</td>
<td>21%</td>
<td>100 s</td>
<td>100 s</td>
<td>Present case</td>
</tr>
<tr>
<td>5</td>
<td>VO₂</td>
<td>Humidity</td>
<td>room temperature</td>
<td>0.27 Ω/%RH (in 10-40 %RH), 0.07 Ω/%RH (in 40-90 %RH)</td>
<td>---</td>
<td>---</td>
<td>Present case</td>
</tr>
</tbody>
</table>

Table 1 Comparison of VO₂ sensor response towards different gas.
