Supporting information

Fig. S1 (a) top and (b) side view of sensor holder. (c) The inside plate of dimensions 20x20 mm with the sensor pellet of 7mm diameter in the center.

Fig. S2 TGA profile of 1-MeOH, vacuum dried 1-off-MeOH.
Fig. S3 Spin-state tracking by $^{57}$Fe Mossbauer spectroscopy at 298 K of (a) 1-EtOH, (b) 1-off-EtOH, which shows memory effect in EtOH detection.

Fig. S4 Diffuse-reflectance spectroscopy of 1 and four TICs guests diffusion on 1 at 298 K.
Table S1 Overview of $^{57}$Fe Mössbauer parameters for sensing alcohols

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Spin state</th>
<th>Mössbauer parameters</th>
<th>% of species</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HS</td>
<td>$\delta$ (mm/s)</td>
<td>$\Delta E_Q$ (mm/s)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.17(2)</td>
<td>3.18(3)</td>
</tr>
<tr>
<td>1-MeOH</td>
<td>HS</td>
<td>1.17(1)</td>
<td>3.17(1)</td>
</tr>
<tr>
<td></td>
<td>HS1</td>
<td>1.14(2)</td>
<td>2.56(5)</td>
</tr>
<tr>
<td></td>
<td>HS2</td>
<td>0.83(3)</td>
<td>2.40(5)</td>
</tr>
<tr>
<td></td>
<td>LS</td>
<td>0.37(1)</td>
<td>0.20(2)</td>
</tr>
<tr>
<td>1-off-MeOH</td>
<td>HS</td>
<td>1.19 (1)</td>
<td>3.18(2)</td>
</tr>
<tr>
<td></td>
<td>HS1</td>
<td>1.15(3)</td>
<td>2.59(6)</td>
</tr>
<tr>
<td></td>
<td>HS2</td>
<td>0.84(6)</td>
<td>2.42(10)</td>
</tr>
<tr>
<td></td>
<td>LS</td>
<td>0.36(2)</td>
<td>0.21(4)</td>
</tr>
<tr>
<td>1-EtOH</td>
<td>HS</td>
<td>1.17(1)</td>
<td>3.17(1)</td>
</tr>
<tr>
<td></td>
<td>HS2</td>
<td>0.90(1)</td>
<td>2.88(8)</td>
</tr>
<tr>
<td></td>
<td>LS</td>
<td>0.15(3)</td>
<td>0.47(4)</td>
</tr>
<tr>
<td>1-off-EtOH</td>
<td>HS</td>
<td>1.19 (1)</td>
<td>3.18(1)</td>
</tr>
<tr>
<td></td>
<td>HS2</td>
<td>1.00(1)</td>
<td>2.73(8)</td>
</tr>
<tr>
<td></td>
<td>LS</td>
<td>0.14(4)</td>
<td>0.48(7)</td>
</tr>
<tr>
<td>1-Regeneration</td>
<td>HS</td>
<td>1.18(1)</td>
<td>3.18(1)</td>
</tr>
</tbody>
</table>

$^\delta$: isomer shift (r.t., vs. $\alpha$-Fe); $\Delta E_Q$: quadrupole splitting, $\Gamma/2$: half width at half maximum

Table S2 Overview of $^{57}$Fe Mössbauer parameters for 1-HCl, 1-HBr, 1-NH$_3$ and 1-N$_2$H$_4$.

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Spin state</th>
<th>Mössbauer parameters</th>
<th>% of species</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HS</td>
<td>$\delta$ (mm/s)</td>
<td>$\Delta E_Q$ (mm/s)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.17(2)</td>
<td>3.18(3)</td>
</tr>
<tr>
<td>1-HCl</td>
<td>HS</td>
<td>1.06(1)</td>
<td>3.26(1)</td>
</tr>
<tr>
<td>1-HBr</td>
<td>HS</td>
<td>1.16(1)</td>
<td>3.14(1)</td>
</tr>
<tr>
<td>1-NH$_3$</td>
<td>HS</td>
<td>1.17(1)</td>
<td>3.13(3)</td>
</tr>
<tr>
<td></td>
<td>LS</td>
<td>0.36(3)</td>
<td>0.65(5)</td>
</tr>
<tr>
<td>1-NH$_3$ (78K)</td>
<td>HS</td>
<td>1.16(1)</td>
<td>3.38(1)</td>
</tr>
<tr>
<td></td>
<td>LS</td>
<td>0.36(1)</td>
<td>0.67(2)</td>
</tr>
<tr>
<td>1-N$_2$H$_4$</td>
<td>HS</td>
<td>1.14(1)</td>
<td>3.16(2)</td>
</tr>
<tr>
<td></td>
<td>HS-2</td>
<td>1.03(2)</td>
<td>2.61(8)</td>
</tr>
</tbody>
</table>

$^\delta$: isomer shift (r.t., vs. $\alpha$-Fe); $\Delta E_Q$: quadrupole splitting, $\Gamma/2$: half width at half maximum
### Table S3: Database of digital colour vectors for four TICs, MeOH and humidity tests.

<table>
<thead>
<tr>
<th>Samples</th>
<th>RGB</th>
<th>HSV</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red</td>
<td>Green</td>
<td>Blue</td>
</tr>
<tr>
<td>Humidity 1</td>
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</tr>
<tr>
<td>Humidity 2</td>
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<td>5</td>
</tr>
<tr>
<td>Humidity 3</td>
<td>140</td>
<td>4</td>
</tr>
<tr>
<td>HCl-10 min-1</td>
<td>44</td>
<td>47</td>
</tr>
<tr>
<td>HCl-10 min-2</td>
<td>44</td>
<td>47</td>
</tr>
<tr>
<td>HCl-10 min-3</td>
<td>46</td>
<td>59</td>
</tr>
<tr>
<td>NH₃-10 min-1</td>
<td>28</td>
<td>47</td>
</tr>
<tr>
<td>NH₃-10 min-2</td>
<td>30</td>
<td>53</td>
</tr>
<tr>
<td>NH₃-10 min-3</td>
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<td>55</td>
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<tr>
<td>HBr-1h-1</td>
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<td>88</td>
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<td>HBr-1h-2</td>
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<tr>
<td>HBr-1h-3</td>
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<tr>
<td>N₂H₄-1h-1</td>
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<td>N₂H₄-1h-2</td>
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<td>MeOH-7h-2</td>
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<tr>
<td>MeOH-7h-3</td>
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<td>37</td>
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</tbody>
</table>

### Table S4: Database of digital colour vectors of response time vs. guest vapors of four TICs and MeOH under vapor diffusion.

<table>
<thead>
<tr>
<th>Samples</th>
<th>Time</th>
<th>RGB</th>
<th>HSV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red</td>
<td>Green</td>
<td>Blue</td>
<td>Hue</td>
</tr>
<tr>
<td>HCl</td>
<td>0</td>
<td>127</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>1 min</td>
<td>57</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>2 min</td>
<td>56</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>5 min</td>
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<td>NH₃</td>
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<td></td>
<td>1 min</td>
<td>37</td>
<td>19</td>
</tr>
<tr>
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<td>2 min</td>
<td>32</td>
<td>36</td>
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<tr>
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<td>5 min</td>
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<td>47</td>
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<td>10 min</td>
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