UiO-67 Metal-organic framework immobilized Fe$^{3+}$ catalyst for efficient Morita-Baylis-Hillman reaction

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Fig. S1 XPS spectra of UiO-67
Fig. S2 PXRD pattern of UiO-67@Fe and recycled UiO-67@Fe

Fig. S3 FT-IR pattern of UiO-67@Fe and recycled UiO-67@Fe
Fig. S4 TEM observation of UiO-67
Table S1 Various catalysts of MBH reaction of cyclopentenone with benzaldehyde.

![Chemical structure of MBH reaction](image)

<table>
<thead>
<tr>
<th>Entry</th>
<th>Catalyst</th>
<th>Solvent</th>
<th>Time (h)</th>
<th>Temp. (℃)</th>
<th>Yield (%)</th>
<th>TON&lt;sup&gt;a&lt;/sup&gt;</th>
<th>TOF (h&lt;sup&gt;-1&lt;/sup&gt;)&lt;sup&gt;b&lt;/sup&gt;</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UiO-67@Fe (1.0 mol%)</td>
<td>THF</td>
<td>6</td>
<td>23</td>
<td>93</td>
<td>93</td>
<td>15.5</td>
<td>This work</td>
</tr>
<tr>
<td>2</td>
<td>NMP (5.0 mol%)/Ba(OH)&lt;sub&gt;2&lt;/sub&gt; (1.5 mol%)&lt;sup&gt;11&lt;/sup&gt;</td>
<td>CH&lt;sub&gt;3&lt;/sub&gt;OH/CH&lt;sub&gt;2&lt;/sub&gt;Cl&lt;sub&gt;2&lt;/sub&gt;</td>
<td>9</td>
<td>0</td>
<td>72</td>
<td>48</td>
<td>5.3</td>
<td>[1]</td>
</tr>
<tr>
<td>3</td>
<td>α-ZrP/Urloci/Cu&lt;sup&gt;2+&lt;/sup&gt; (20mg)&lt;sup&gt;21&lt;/sup&gt;</td>
<td>DMF</td>
<td>15</td>
<td>r.t.</td>
<td>74</td>
<td>-</td>
<td>-</td>
<td>[2]</td>
</tr>
<tr>
<td>4</td>
<td>Fu (+)-DMAP/(10mol%)</td>
<td>i-PrOH</td>
<td>24</td>
<td>-20</td>
<td>87</td>
<td>8.7</td>
<td>0.36</td>
<td>[3]</td>
</tr>
<tr>
<td>5</td>
<td>IRMOF-3–thiourea (2 mol%)&lt;sup&gt;4&lt;/sup&gt;</td>
<td>THF</td>
<td>24</td>
<td>4</td>
<td>73</td>
<td>36.5</td>
<td>1.52</td>
<td>[4]</td>
</tr>
</tbody>
</table>

<sup>a</sup>Turnover number = mol converted/mol of active sites. <sup>b</sup>Turnover frequency = Turnover number/reaction time.

**References**

NMR spectra:
3a 2-[(4-Fluoro-phenyl)-hydroxy-methyl]-cyclopent-2-enone
3b 2-[(4-Bromo-phenyl)-hydroxy-methyl]-cyclopent-2-enone

![Chemical Structure](image)
3e 2-[(3-Bromo-phenyl)-hydroxy-methyl]-cyclopent-2-enone
3d 2-[(4-Chloro-phenyl)-hydroxy-methyl]-cyclopent-2-enone
3e 2-(Hydroxy-phenyl-methyl)-cyclopent-2-enone
3f 2-(Hydroxy-m-tolyl-methyl)-cyclopent-2-enone
3g 2-[hydroxy-(4-methoxy-phenyl)-methyl]-cyclopent-2-enone
3h 2-(Hydroxy-naphthalen-2-yl-methyl)-cyclopent-2-enone
3i 2-(1-Hydroxy-3-phenyl-allyl)-cyclopent-2-enone
3j 2-(1-Hydroxy-3-phenyl-propyl)-cyclopent-2-enone