Promoting Effect of Mn on In Situ Synthesized Cu-SSZ-13 for NH$_3$-SCR

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Figure S1. Concentration of N₂O produced by the prepared catalysts under NH₃-SCR conditions.
Figure S2. SEM images of prepared catalysts. (a) Cu-SSZ-13, (b) 3%Mn/Cu-SSZ-13, (c) 5%Mn/Cu-SSZ-13, (d) 7%Mn/Cu-SSZ-13, (e) 10%Mn/Cu-SSZ-13, (f) 14%Mn/Cu-SSZ-13.
<table>
<thead>
<tr>
<th>Atomic composition /%</th>
<th>O</th>
<th>Al</th>
<th>Si</th>
<th>Mn</th>
<th>Cu</th>
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<tbody>
<tr>
<td>Cu-SSZ-13</td>
<td>68.1</td>
<td>6.3</td>
<td>22.3</td>
<td>/</td>
<td>3.3</td>
</tr>
<tr>
<td>5% Mn/Cu-SSZ-13</td>
<td>67.8</td>
<td>6.0</td>
<td>21.8</td>
<td>1.8</td>
<td>2.6</td>
</tr>
</tbody>
</table>

**Figure S3.** EDX results of catalysts (a) Cu-SSZ-13 (b) 5% Mn/Cu-SSZ-13.
Figure S4. XRD patterns of Cu-SSZ-13 catalysts with and without Mn impregnation.
Figure S5. XPS spectra of catalysts. (a) Cu 2p spectra of Cu-SSZ-13 and 5% Mn/Cu-SSZ-13, (b) Mn 2p spectra of 5% Mn/Cu-SSZ-13.
Figure S6. Integrated NH$_3$ desorption amounts per 1 g of catalyst, calculated from NH$_3$-TPD results.
Figure S7. XRD patterns of 5% Mn/Cu-SSZ-13 catalysts before and after being used. 5% Mn/Cu-SSZ-13 NH₃-SCR cycle was the catalysts that used by NH₃-SCR activity test. 5% Mn/Cu-SSZ-13 24h was the catalyst that used in the NH₃-SCR test at 135 °C for 24h.