Electronica Supplementary Material (ESM)

Discussing the performance of beta zeolites in aqueous-phase valorization of xylose

Tiago L. Coelho, Bruna Marinho, Elise M. Albuquerque, Marco A. Fraga*

Instituto Nacional de Tecnologia/MCTIC, Divisão de Catálise e Processos Químicos, Av. Venezuela, 82, sala 518, 20081-312 Rio de Janeiro – RJ –Brazil

*Corresponding author. E-mail address: marco.fraga@int.gov.br
Fig. SM1. FTIR of hydrated SiAl12 catalyst under different time of evacuation (from 0 to 240 min).
Figure SM2. X-ray diffractograms of fresh zeolites SiAl8, SiAl12 and SiAl19.
Figure SM3. $^{29}$Si NMR spectra for SiAl8 and SiAl12 zeolites. (a) experimental and deconvoluted spectra for (b) SiAl8 and (c) SiAl12.
Figure SM4. $^{27}$Al NMR spectra for fresh zeolites.
Figure SM5. $^{27}$Al NMR spectra for SiAl8, SiAl12 and SiAl19 dehydrated zeolites.
Table SM1. Concentration of Brønsted and Lewis acid sites calculated by IR of adsorbed pyridine for dehydrated zeolites.

<table>
<thead>
<tr>
<th>Catalysts</th>
<th>Brønsted acid sites (µmol g⁻¹)</th>
<th>Lewis acid sites (µmol g⁻¹)</th>
<th>Lewis /Brønsted</th>
<th>Total acid sites (µmol g⁻¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiAl8</td>
<td>340</td>
<td>600</td>
<td>1.76</td>
<td>940</td>
</tr>
<tr>
<td>SiAl12</td>
<td>230</td>
<td>285</td>
<td>1.24</td>
<td>515</td>
</tr>
<tr>
<td>SiAl19</td>
<td>190</td>
<td>165</td>
<td>0.87</td>
<td>355</td>
</tr>
</tbody>
</table>
Figure SM6. X-ray diffraction of spent zeolites.
Figure SM7. $^{29}$Si NMR spectra for spent SiAl8 and SiAl12 zeolites.
Figure SM8. $^{27}$Al NMR spectra for spent zeolites.
Figure SM9. Correlations between initial rate and acid sites in all three dehydrated zeolites catalysts.
Figure SM10. Time-resolved xylose conversions for all three zeolite catalysts in the early reaction time region.
Figure SM11. Photo of aliquots and SiAl12 sample after 6 h of reaction at 130, 150 and 170 °C.