Supplementary Information

A comparison study between V-SBA-15 and V-KIT-6 catalysts for selective oxidation of diphenylmethane

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Preparation of the catalysts

The V-SBA-15 (25) catalyst were synthesized by hydrothermally using ammonium metavanadate as a vanadium source. About 3.89 g triblock copolymer poly (ethylene glycol)-block-poly (propylene glycol)-block-poly (ethylene glycol)-(Pluronic P123, molecular weight = 5,800, EO\textsubscript{20}-PO\textsubscript{70}-EO\textsubscript{20}, ALDRICH, USA) was dissolved in 30.0 g of distilled water and stirred for 3 h. Required amount of Tetraethyl orthosilicate (TEOS, MERCK 98%, USA) and amount of ammonium metavanadate (NH\textsubscript{4}VO\textsubscript{3}, SRL 97%, INDIA) were added directly to the polymer containing homogenous solution. The pH of the solution was adjusted to 3 by using 0.3 M HCl. The gel was transferred into the autoclave and heated for 24 h at 373 K for 48 h. The green solid was washed with distilled water and dried at 343 K for 12 h. The material was calcined at 773 K for 6 h. The same procedure was followed for V-KIT-6 catalyst, the only difference was the additional use of a co-surfactant (butanol).

![Figure S1](image-url)  
**Figure S1**  \( \text{N}_2 \) adsorption-desorption isotherms of Si-KIT-6 and V-KIT-6 catalysts; (BJH plot inserted in the Figure)
**Figure S2** XPS spectra of Si2P\textsubscript{3/2} region of calcined V-KIT-6 and V-SBA-15 catalysts

**Table S1** Textural properties of the catalysts

<table>
<thead>
<tr>
<th>Catalysts</th>
<th>Vanadium content (wt.%)</th>
<th>‘d’ spacing</th>
<th>Wall thickness(^a) (nm)</th>
<th>Unit cell parameter(^b) ((a_0))</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-SBA-15</td>
<td>3.1</td>
<td>10.375</td>
<td>5.6</td>
<td>12.02(^b)</td>
</tr>
<tr>
<td>V-KIT-6</td>
<td>3.2</td>
<td>9.74</td>
<td>7.3</td>
<td>23.85(^c)</td>
</tr>
</tbody>
</table>

\(^a\)Wall thickness = Unit cell parameter – Pore diameter

\(^b\)Unit cell parameter values calculated using \(a_0 = \frac{2d_{(100)}}{\sqrt{3}}\)

\(^c\)Unit cell parameter values calculated using \(a_0 = \sqrt{6} d_{(211)}\)