Supporting Information

Catalytic Dehydrogenation of Isobutane over Ga$_2$O$_3$/ZnO Interface:

Reaction Routes and Mechanism

By

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**Table S1.** Dehydrogenation performance of different catalysts.
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Figure S2. Dehydrogenation performance of isobutane over 5ZnO-Ga$_2$O$_3$ catalyst with TOS under the reaction conditions of 560 °C, 4 mL catalyst loading, and 210 h$^{-1}$ gas space velocity.
**Figure S3.** Cvetanovic curves obtained by isobutane TPD experiments over different samples: (a) Ga$_2$O$_3$; (b) ZnO; (c) 5ZnO-Ga$_2$O$_3$. 
Figure S4. Pyridine IR spectra of Ga$_2$O$_3$ and ZnO samples.
**Table S1. Dehydrogenation performance of different catalysts**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Isobutane conversion, wt%</th>
<th>Isobutene selectivity, wt%</th>
<th>Isobutene yield, wt%</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) 5ZnO-Ga$_2$O$_3$ (20-60 mesh)$^b$</td>
<td>46.4</td>
<td>76.2</td>
<td>35.4</td>
</tr>
<tr>
<td>(b) 5ZnO-Ga$_2$O$_3$ (20-60 mesh)$^c$</td>
<td>62.4</td>
<td>84.7</td>
<td>52.9</td>
</tr>
<tr>
<td>5ZnO-Al$_2$O$_3$</td>
<td>50.1</td>
<td>84.4</td>
<td>42.3</td>
</tr>
</tbody>
</table>

$^a$ Reaction conditions: 560 °C, 4 mL catalyst loading, and 210 h$^{-1}$ gas space velocity.

$^b$ Sample (a) was fabricated by separately pressing and grinding ZnO and Ga$_2$O$_3$ into 20-60 mesh particles, and then mixing together.

$^c$ Sample (b) was fabricated by mixing ZnO and Ga$_2$O$_3$ together firstly, and then pressing and grinding the mixture into 20-60 mesh particles.