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SAPO-34 Templated by Dipropylamine and Diisopropylamine: Synthesis and Catalytic Performance in the Methanol to Olefins (MTO) Reaction

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1 XRD

\textbf{Figure S1} Powder XRD patterns of the as-synthesized samples (shown in Table 1) 1(a), 2(b), 3(c), 4(d), 8(e), 9 (f), 10 (g), 11 (h) and R1 (i)
Figure S2 Powder XRD patterns of the as-synthesized samples for DPA and DIPA system with shortened crystallization time [3 h (DPA-3h and DIPA-3h) or 12 h (DPA-12h and DIPA-12h)]; gel composition R: Al₂O₃: P₂O₅: SiO₂: H₂O= 3.0: 1.2: 0.9: 0.5: 40 (R=DPA or DIPA).

2 SEM

Figure S3 SEM image of the as-synthesized crystals of sample 4.
Figure S4 SEM image of the as-synthesized crystals of sample 10.

Figure S5 SEM image of the as-synthesized crystals of sample R1.
3 $^{27}$Al MAS NMR

Figure S6 $^{27}$Al MAS NMR of the calcined samples 4 (a), 10 (b) and R1 (c).

4 $^{31}$P MAS NMR

Figure S7 $^{31}$P MAS NMR of the calcined samples 4 (a), 10 (b) and R1 (c).
## 5 MTO results

### Table S1 The MTO reaction results on the samples

<table>
<thead>
<tr>
<th>Lifetime&lt;sup&gt;a&lt;/sup&gt; (min)</th>
<th>Selectivity (wt%)</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CH&lt;sub&gt;4&lt;/sub&gt;</td>
<td>C&lt;sub&gt;2&lt;/sub&gt;H&lt;sub&gt;4&lt;/sub&gt;</td>
</tr>
<tr>
<td>4</td>
<td>1.2</td>
<td>43.0</td>
</tr>
<tr>
<td>10</td>
<td>1.2</td>
<td>51.2</td>
</tr>
<tr>
<td>R1</td>
<td>1.5</td>
<td>42</td>
</tr>
</tbody>
</table>

<sup>a</sup>The catalyst lifetime is defined as the reaction duration with >99% methanol conversion.