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Oxidation of Alcohols Using CoFe$_2$O$_4$@APTES@Ni(OH)$_2$

**Significance:** Nickel hydroxide coated nanocobalt ferrite [CoFe$_2$O$_4$@APTES@Ni(OH)$_2$] was prepared by the reaction of CoFe$_2$O$_4$ with 3-aminopropyltriethoxysilane (APTES) followed by treatment with NiCl$_2$·7H$_2$O in aqueous alkaline (eq. 1). CoFe$_2$O$_4$@APTES@Ni(OH)$_2$ catalyzed the oxidation of alcohols with hydrogen peroxide to give the corresponding aldehydes in up to >99% conversion with up to >99% selectivity (eq. 2).

**Comment:** CoFe$_2$O$_4$@APTES@Ni(OH)$_2$ was characterized by AAS, FT-IR, UV/Vis, XRD, TEM, FESEM, N$_2$ adsorption, and VSM analyses. The catalyst was recovered by magnetic separation and reused four times without significant loss of catalytic activity.

**Results:**

<table>
<thead>
<tr>
<th>Conversion</th>
<th>Selectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>87%</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>70%</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>66%</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>62%</td>
<td>&gt;98%</td>
</tr>
<tr>
<td>73%</td>
<td>&gt;98%</td>
</tr>
<tr>
<td>79%</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>71%</td>
<td>&gt;98%</td>
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<tr>
<td>&gt;99%</td>
<td>&gt;99%</td>
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<tr>
<td>97%</td>
<td>&gt;97%</td>
</tr>
<tr>
<td>42%</td>
<td>&gt;98%</td>
</tr>
<tr>
<td>34%</td>
<td>&gt;98%</td>
</tr>
</tbody>
</table>

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