HETEROGENEOUS CATALYTIC ACTIVITY ON Mn, Fe AND Co-BASED METALLOPORPHYRINIC SOLID COORDINATION FRAMEWORKS (SCFs)

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INTRODUCTION

Solid Coordination Frameworks (SCFs) have been widely explored on different catalytic reactions,1 and during the past years metalloporphyrins have been investigating in order to mimic their natural activity in the solid state.2

Herein we present the catalytic activity results towards the oxidation reactions of different alcohols for MnTPPS, FeTCP and CoTPP based metalloporphyrinic SCFs (TPPS= meso-tetrasulphonatophenylporphin, TCP= meso-tetra(3-carboxyphenyl)porphin).3 Additionally, Knoevenagel condensations and a “one-pot” reaction involving the FeTCP based SCF catalyst have been carried out.

CATALYTIC ACTIVITY TESTS

Alcohol oxidation

<table>
<thead>
<tr>
<th>Substrate</th>
<th>C&lt;sub&gt;6&lt;/sub&gt;H&lt;sub&gt;11&lt;/sub&gt;OH</th>
<th>C&lt;sub&gt;2&lt;/sub&gt;H&lt;sub&gt;5&lt;/sub&gt;OH</th>
<th>C&lt;sub&gt;3&lt;/sub&gt;H&lt;sub&gt;7&lt;/sub&gt;OH</th>
<th>C&lt;sub&gt;4&lt;/sub&gt;H&lt;sub&gt;9&lt;/sub&gt;OH</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBP</td>
<td>43%</td>
<td>48%</td>
<td>52%</td>
<td>57%</td>
</tr>
<tr>
<td>TBP&lt;sup&gt;+&lt;/sup&gt;</td>
<td>50%</td>
<td>55%</td>
<td>60%</td>
<td>65%</td>
</tr>
<tr>
<td>1-phenol</td>
<td>66%</td>
<td>71%</td>
<td>76%</td>
<td>81%</td>
</tr>
<tr>
<td>3-benzyl</td>
<td>92%</td>
<td>95%</td>
<td>98%</td>
<td>100%</td>
</tr>
<tr>
<td>3-phenyl</td>
<td>66%</td>
<td>71%</td>
<td>76%</td>
<td>81%</td>
</tr>
</tbody>
</table>

Knoevenagel condensation

“One-pot” reaction: hydrolysis of acetal + Knoevenagel condensation

CONCLUSIONS

-MnTPPS, FeTCP and CoTPP based metalloporphyrinic SCFs are promising heterogeneous catalysts.

-The most important feature of the compounds herein studied is not their dimensionality but the accessibility to the active centers of the network.

REFERENCES


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