Additional Homework Problems

Web P7-1 A Collection and Analysis of Rate Data

\[ A \rightarrow B + C \]

From the plot shown, what is the reaction order and specific reaction rate?

Web P7-2 B The liquid-phase reaction of methanol and triphenyl takes place in a batch reactor at 25°C

\[ \text{CH}_3\text{OH} + (\text{C}_6\text{H}_5)_3 \rightarrow (\text{C}_6\text{H}_5)_3\text{COCH}_3 + \text{HCl} \]

\[ A + B \rightarrow C + D \]

For an equal molar feed, the following concentration-time data was obtained for methanol:

<table>
<thead>
<tr>
<th>( C_A ) (mol/dm(^3))</th>
<th>1.0</th>
<th>0.95</th>
<th>0.816</th>
<th>0.707</th>
<th>0.50</th>
<th>0.370</th>
</tr>
</thead>
<tbody>
<tr>
<td>( t ) (h)</td>
<td>0.0</td>
<td>0.278</td>
<td>1.389</td>
<td>2.78</td>
<td>8.33</td>
<td>16.66</td>
</tr>
</tbody>
</table>

The following concentration-time data were obtained for an initial methanol concentration 0.1 mol/dm\(^3\) and an initial triphenyl of 1.0 mol/dm\(^3\):

<table>
<thead>
<tr>
<th>( C_A ) (mol/dm(^3))</th>
<th>1.0</th>
<th>0.0847</th>
<th>0.0735</th>
<th>0.0526</th>
<th>0.0357</th>
</tr>
</thead>
<tbody>
<tr>
<td>( t ) (h)</td>
<td>0.0</td>
<td>1.0</td>
<td>2.0</td>
<td>5.0</td>
<td>10.0</td>
</tr>
</tbody>
</table>

(a) Determine the rate law and rate law parameters.
(b) If you were to take more data points, what would be the reasonable settings (e.g., \( C_{A_0} \), \( C_{B_0} \))? Why?