CONCLUSIONS

1. L zeolite exhibits weak selectivity for \( \text{NH}_4^+ \) cations which decreases as the degree of ion exchange increases in substitution of potassium cations with ammonia ions.

2. Only L zeolites with a degree of decationization above 50% exhibit catalytic activity in transformation of \( \alpha \)-xylene.

3. Isomerization of xylenes on L zeolites primarily takes place by means of intramolecular transformations.

LITERATURE CITED


REACTION OF ACETALS WITH ALIPHATIC NITRO COMPOUNDS.

COMMUNICATION 4. REACTION OF ALIPHATIC AND ALICYCLIC KETALS WITH NITROACETIC ACID ESTER AND SYNTHESIS OF \( \alpha,\beta \)-DEHYDRO-\( \alpha \)-ACETYLMINO ACID ESTERS

K. A. Kochetkov, K. K. Babievskii, N. S. Tarbalinskaya, and F. M. Belikov

\( \alpha,\beta \)-Dehydro-\( \omega \)-amino acids (\( \Delta \)AA) are necessary for the preparation of new antibiotics, phytotoxic peptides [1, 2], and other physiologically active compounds. \( \Delta \)AA have also become increasingly important as substrates for asymmetric reduction to optically active \( \omega \)-amino acids (AA) [3].

The present article concerns the study of the alkoxyalkylation of nitroacetic acid ester (NAE) by open-chain ketals (I) as a possible means of synthesis of difficult-to-obtain \( \beta,\beta \)-disubstituted \( \Delta \)AA.

It was previously shown that open-chain [4, 5] and cyclic [6] benzaldehyde acetalts and some ring-substituted derivatives easily alkylate NAE in the presence of \( \text{Ac}_2\text{O} \) with formation of \( \omega \)-nitrocinamic acid esters; the latter were then used for synthesis of AA from the phenylalanine series. Cyclic ketals did not react with NAE in the condition studied [6]. In the present article, it is shown that ketals (I) in the presence of \( \text{Ac}_2\text{O} \) react with NAE during heating in an inert solvent with formation of \( \beta,\beta \)-disubstituted \( \beta \)-alkoxy-\( \omega \)-nitrocarboxylic acids (II) with high yields (Table 1). The best results were obtained with a twofold excess of (I) and \( \text{Ac}_2\text{O} \) with respect to the ratio to NAE. The reaction of (I) with NAE is more difficult than in the case of aromatic acetals.

<table>
<thead>
<tr>
<th>Compound</th>
<th>Time, h</th>
<th>Yield, %*</th>
<th>bp, °C (p, mm Hg)</th>
<th>IR spectrum (ν, cm⁻¹ in a thin layer)</th>
<th>PMR spectrum (δ, ppm, CCL₃)</th>
<th>Empirical formula</th>
<th>Observed/Calculated, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>(IIa)</td>
<td>9</td>
<td>79</td>
<td>90–93(3)</td>
<td>1755, 1565, 1375</td>
<td>1.4 s (6H); 3.2 s (3H); 3.75 s (3H); 5.38 s (H)</td>
<td>C₆H₁₂NO₃</td>
<td>44.41 6.64 7.79</td>
</tr>
<tr>
<td>(IIb)</td>
<td>8</td>
<td>89</td>
<td>85–88(1)</td>
<td>1760, 1565, 1370</td>
<td>1.4 s (3H); 1.4 s (6H); 3.5 q (2H); 3.8 s (3H); 5.5 i (H)</td>
<td>C₆H₁₂NO₃</td>
<td>46.92 6.85 7.33</td>
</tr>
<tr>
<td>(IIc)</td>
<td>10</td>
<td>68</td>
<td>95–103(1)</td>
<td>1750, 1560, 1365</td>
<td>0.85 t (3H); 1.0 t (3H, OR); 1.4 s (3H, CH₃); 1.8 q (2H); 3.45; 3.55 (2H, CH₃); 3.8 s (3H); 5.45; 5.55 s (CH)</td>
<td>C₆H₁₂NO₃</td>
<td>49.13 7.74 6.06</td>
</tr>
<tr>
<td>(IId)</td>
<td>12</td>
<td>68</td>
<td>110–112(1)</td>
<td>1755, 1555, 1360</td>
<td>1.08 t (3H); 1.5 m (10H); 3.75 s (3H); 3.48 q (2H); 5.48 s (CH)</td>
<td>C₆H₁₂NO₃</td>
<td>53.86 7.81 5.35</td>
</tr>
<tr>
<td>(IIe)</td>
<td>10</td>
<td>56</td>
<td>104–106(1)</td>
<td>1770, 1570, 1380</td>
<td>1.1 t (3H); 1.5 m (4H); 3.75 s (3H); 3.5 q (2H); 5.4 s (CH)</td>
<td>C₆H₁₂NO₃</td>
<td>53.86 7.81 5.71</td>
</tr>
</tbody>
</table>

*After distillation, calculated for NAE.