The structure of some amino acids are shown:

<table>
<thead>
<tr>
<th>Alanine</th>
<th>Lysine</th>
<th>Phenylalanine</th>
<th>Leucine</th>
<th>Aspartic Acid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CH₃</td>
<td></td>
<td>CH₂</td>
<td>CH₂</td>
</tr>
</tbody>
</table>

1. Draw the structure of the species formed from these amino acids at the pH shown.

   - Alanine in pH 7 solution
   - Lysine in pH 2 solution
   - Leucine in pH 12 solution
   - Aspartic acid in pH 12 solution

2. Give the IUPAC name for leucine. ..............................................................

3. Draw the structure of the two possible dipeptides formed when alanine combines with phenylalanine.

4. Alanine has a melting point of 258°C. This is considerably higher than amines or carboxylic acids with similar relative molecular mass. Explain why the melting point of alanine is somewhat higher.
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