Problem Set 10  
S343

Smith Text chapter 13: Problems 1-4, 19, 21, 25, 26, 34, 36

Brown/Foote Text Chapter 14 Problems 1-31

Techniques in Organic Chemistry: Technique 20, problems 2, 3, 4, 6, 8

Additional problems:

1. Explain why there is a small peak at m/z=32 for the compound CH₃NH₂.

2. What do the following abbreviations stand for?
   a. EI  
   b. CI  
   c. FAB

3. Use the rule of 13 to come up with 3 likely formulas that fit M⁺ = 128.

4. Provide mechanisms to account for the fragments seen in the mass spectrum of these compounds.
5. Give the m/z values of two major fragments you would expect to see in the mass spectrum of the following compound. Mark the one that is most likely to show up as the base peak, and explain.

\[ \text{m/z} = \quad \text{m/z} = \]

6. What two circumstances lead to fragments with even m/z values?

7. Give three important pieces of information about the molecular formula of the compound (other than the molecular weight) that you can obtain from this mass spec data.

<table>
<thead>
<tr>
<th>m/z</th>
<th>Relative abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>21</td>
</tr>
<tr>
<td>52</td>
<td>35</td>
</tr>
<tr>
<td>91</td>
<td>100</td>
</tr>
<tr>
<td>102</td>
<td>22</td>
</tr>
<tr>
<td>111 (M⁺)</td>
<td>10</td>
</tr>
<tr>
<td>113</td>
<td>3.3</td>
</tr>
</tbody>
</table>