Lab Instructor Belyayeva Chiemezie Gozde Khajo Mollica

Quiz Ia
February 22, 2017

1. Convert the following molecule from line bond notation to a Lewis structure that shows all the carbon and hydrogen atoms.

2. What is the official IUPAC name of the following molecule?

3. Draw both chair forms of the molecule shown below and circle the one that is lower in energy.

- The question was more difficult than I intended.
- I will grade it more leniently.
1. Convert the following molecule from line bond notation to a Lewis structure that shows all
the carbon and hydrogen atoms.

2. What is the official IUPAC name of the following molecule?

3. Draw both chair forms of the molecule shown below and circle the one that is lower in
energy.
1. Convert the following molecule from line bond notation to a Lewis structure that shows all the carbon and hydrogen atoms.

2. What is the official IUPAC name of the following molecule?

3. Draw both chair forms of the molecule shown below and circle the one that is lower in energy.
1. What is the formal charge on the C atom in the molecule shown below?

\[ \text{NH} = \text{C}^- \text{OH} \]

2. Two resonance forms of the same molecule are shown below. Draw arrows to show how the structure on the left would covert to the structure on the right and how the structure on the right would covert to the structure to the left.

3a. Draw a resonance structure for the molecule shown below.
3b. If your resonance structure has any formal charges, be sure to show them clearly.
1. What is the formal charge on the O atom in the molecule shown below?

2. Two resonance forms of the same molecule are shown below. Draw arrows to show how the structure on the left would convert to the structure on the right and how the structure on the right would convert to the structure to the left.

3a. Draw a resonance structure for the molecule shown below.
3b. If your resonance structure has any formal charges, be sure to show them clearly.
1. What is the formal charge on the N atom in the molecule shown below?

\[ 
\text{NH}_3 \quad \overset{1}{\text{N}} \quad \text{CH}_3 
\]

2. Two resonance forms of the same molecule are shown below. Draw arrows to show how the structure on the left would convert to the structure on the right and how the structure on the right would convert to the structure to the left.

\[ 
\text{H}_3\text{C} \quad \overset{\text{H}}{\text{C}} \quad \text{NH}_2 
\quad \overset{\text{H}}{\text{C}} \quad \text{NH}_2 
\]

3a. Draw a resonance structure for the molecule shown below.
3b. If your resonance structure has any formal charges, be sure to show them clearly.
1. What is the relationship between the following two molecules? Are they identical, enantiomers, diastereomers or constitutional isomers?

![Molecule Image]

2. Label all chiral centers in the molecule shown below.

![Molecule Image]

3. Determine the R/S configuration of the chiral center shown below. Make sure to clearly indicate the priority (1, 2, 3 or 4) of each group attached to the chiral carbon.

![Molecule Image]
Quiz IIIb
March 29, 2017

1. What is the relationship between the following two molecules? Are they identical, enantiomers, diastereomers or constitutional isomers?

2. Label all chiral centers in the molecule shown below.

3. Determine the R/S configuration of the chiral center shown below. Make sure to clearly indicate the priority (1, 2, 3 or 4) of each group attached to the chiral carbon.
Quiz IIIc
March 29, 2017

1. What is the relationship between the following two molecules? Are they identical, enantiomers, diastereomers or constitutional isomers?

2. Label all chiral centers in the molecule shown below.

3. Determine the R/S configuration of the chiral center shown below. Make sure to clearly indicate the priority (1, 2, 3 or 4) of each group attached to the chiral carbon.
1. Give the product of the following reaction:

2. Give the product of the following reaction:

3a. Which functional group (acetal or hemiacetal) is shown in the molecule below?
3b. Draw the structures of the aldehyde and alcohol(s) that were used to synthesize this compound:
1. Give the product of the following reaction:

\[ \text{H}_2 \xrightarrow{\text{catalyst}} \]

2. Give the product of the following reaction:

\[ 2 \text{ equivalents of OH} \]

3a. Which functional group (acetal or hemiacetal) is shown in the molecule below?

3b. Draw the structures of the aldehyde and alcohol(s) that were used to synthesize this compound:
1. Give the product of the following reaction:

\[
\text{NaBH}_4
\]

2. Give the product of the following reaction:

3a. Which functional group (acetal or hemiacetal) is shown in the molecule below?

3b. Draw the structures of the aldehyde and alcohol(s) that were used to synthesize this compound:
1. Convert the following sugar from the open form to the hemiacetal form.
   Draw a 5 membered ring.
   Draw the anomic carbon with the OH group α (alpha).

2. Give the product of the following reaction:

3. Analyze the following disaccharide:
   a. Label the anomic carbons with stars.
   b. Which two carbons (give their numbers) link the two sugars together?
   c. Is this compound a reducing sugar? In other words, does it undergo oxidation with Benedict's or Tollens' reagent?
1. Convert the following sugar from the open form to the hemiacetal form.  
   Draw a 6 membered ring.  
   Draw the anomeric carbon with the OH group β (beta).

2. Give the product of the following reaction:

3. Analyze the following disaccharide:
   a. Label the anomeric carbons with stars.
   b. Is the linkage between the two sugars an alpha or beta linkage? β
   c. Is this compound a reducing sugar? In other words does it undergo oxidation with Benedict’s or Tollens’ reagent? Yes
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Quiz Vc
May 8, 2017

1. Convert the following sugar from the open form to the hemiacetal form.
   Draw a 6 membered ring.
   Draw the anomeric carbon with the OH group β (beta).

2. Give the product of the following reaction:

3. Analyze the following disaccharide:
   a. Label the anomeric carbons with stars.
   b. Which two carbons (give their numbers) link the two sugars?
   c. Is this compound a reducing sugar? In other words, does it undergo oxidation with Benedict’s or Tollens’ reagent?
1. Does the following amino acid contain an acidic, basic, polar or nonpolar side chain?

2. Draw the zwitterion form of the following amino acid:

3. Construct a dipeptide Asp Glu from the amino acids shown below. Make sure to draw the dipeptide in the form it would take in your body (at physiological pH):

4. Below is a lipid found in a cell membrane. CAREFULLY circle the parts of the lipid that participate in hydrogen bonding.
1. Does the following amino acid contain an acidic, basic, polar or nonpolar side chain?

2. Draw the zwitterion form of the following amino acid:

3. Construct a dipeptide Asn Asp from the amino acids shown below. Make sure to draw the dipeptide in the form it would take in your body (at physiological pH):

4. Below is a lipid found in a cell membrane. CAREFULLY circle the parts of the lipid that are nonpolar.
1. Does the following amino acid contain an acidic, basic, polar or nonpolar side chain?

![Amino Acid Structure]

2. Draw the zwitterion form of the following amino acid:

![Amino Acid Structure]

3. Construct a dipeptide Gln Glu from the amino acids shown below. Make sure to draw the dipeptide in the form it would take in your body (at physiological pH):

![Amino Acid Structures]

4. Below is a lipid found in a cell membrane. CAREFULLY circle the parts of the lipid that are polar.

![Lipid Structure]

Note: The H's on the CH2 groups are not polar.