Problem set 4, Chem 108, W-01

1. Write the structure of the tripeptide alanylprolyllysine, as it would appear at pH 7. After acid hydrolysis into individual amino acids, show the products as they would appear at pH 1.

2. Show how you might start with a dipeptide, isoleucylglutamine, and specifically add a methionine to the N-terminus. Repeat for the C-terminus.

3. An unknown hexapeptide is determined by complete hydrolysis to have the amino acid composition 2-Ala, Lys, Glu, Phe, Cys.

   Edman degradation releases Ala followed by Cys.

   Chymotrypsin hydrolysis gives two tripeptides, both of which have Ala at their N-termini.

   Trypsin hydrolysis gives a pentapeptide plus Glu.

   Identify the amino acid sequence of the hexapeptide.

4. Formulate a mechanism to account for the acid catalyzed conversion of an aldehyde to its hydrated form.

5. Which of the following structures corresponds to a reducing sugar? When you identify one, indicate the product that would be formed upon oxidation using [a] the Tollens' reagent; [b] Benedict's reagent.

6. What is the absolute configuration at the α-carbon of naturally occurring alanine?