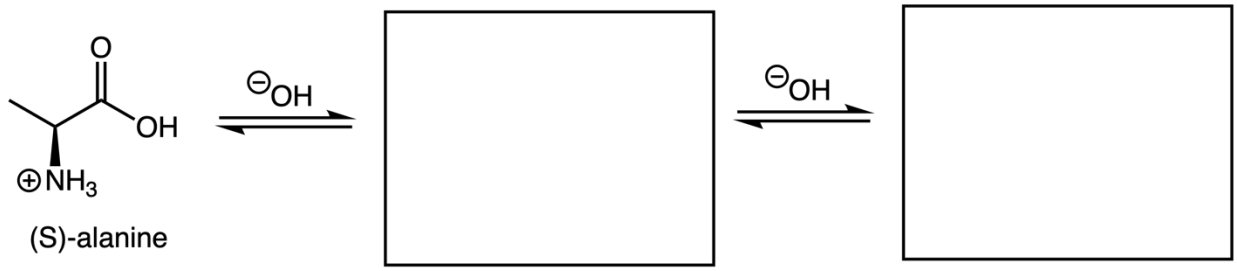
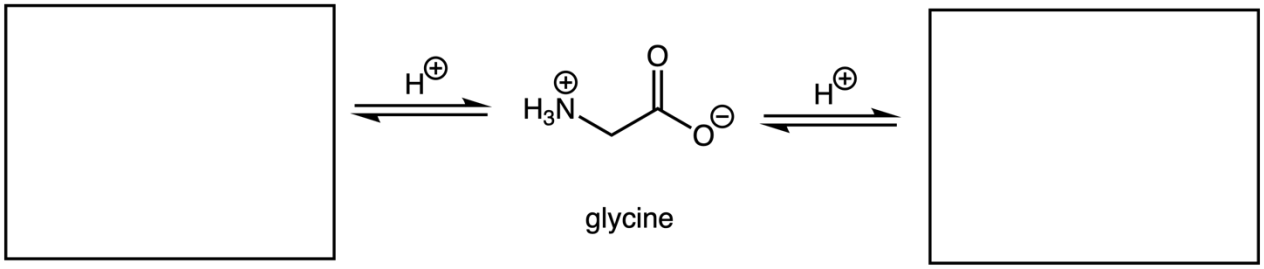
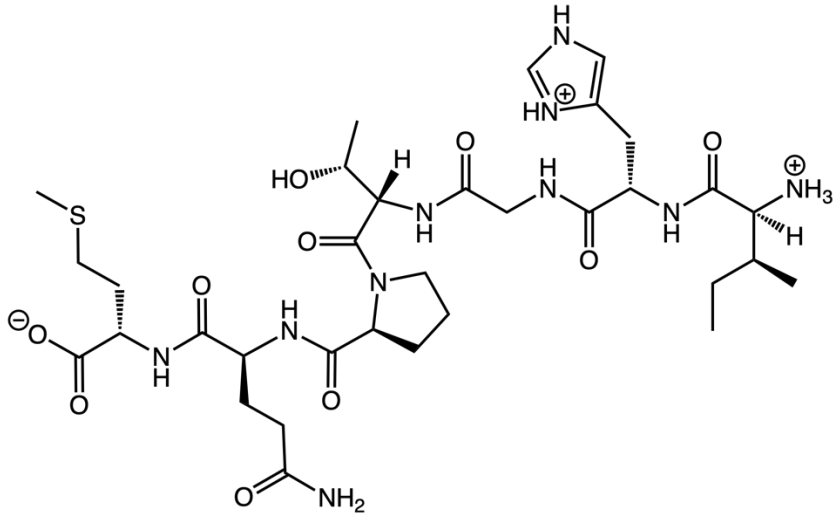
1. Complete the following schemes for (*S*)-alanine and glycine.



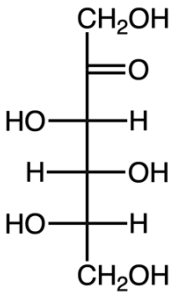


2. Identify all the amino acids that make up the following peptide. Then name the peptide using the three-letter abbreviations for the amino acids.



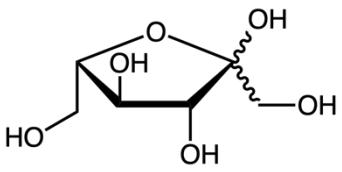
3. Identify the net charge on each of the following at pH = 6. Assign each as acidic, basic, or neutral.
   A) GlyLeuVal
   B) LeuTrpLysGlyLys
   C) GluLysAspAlaPheIle
4. Predict the most likely product formed from heating alanine in methanol with HCl catalyst.

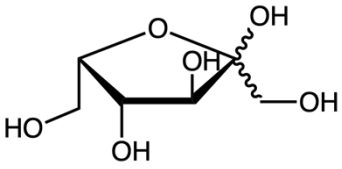
5. Consider L-sorbose, which is shown in the following Fischer projection.



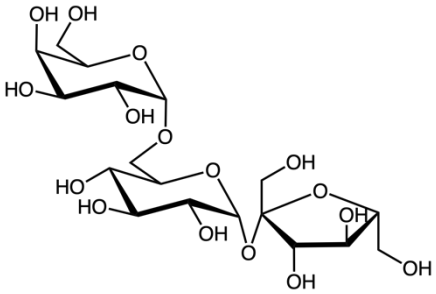
   A) Which of the following describe sorbose?
      i. Hexose
      ii. Aldohexose
      iii. Ketohexose
      iv. Glycoside

   B) Which of the following is the correct Haworth projection for the cyclic form of sorbose?





6. Consider the trisaccharide raffinose.



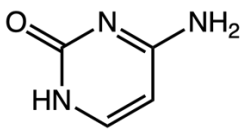
   A) Is raffinose a reducing sugar? How can you tell?

   B) Assign each of the glycosidic bonds as α or β.

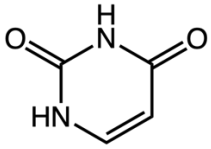
7. The compounds cytosine, uracil, and thymine are shown below. Each exhibits aromatic character.

   A) What are the requirements for a compound to be aromatic?

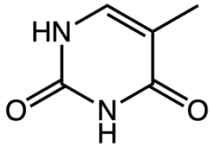
   B) Explain why the following compounds might have aromatic character.



cytosine



uracil



thymine