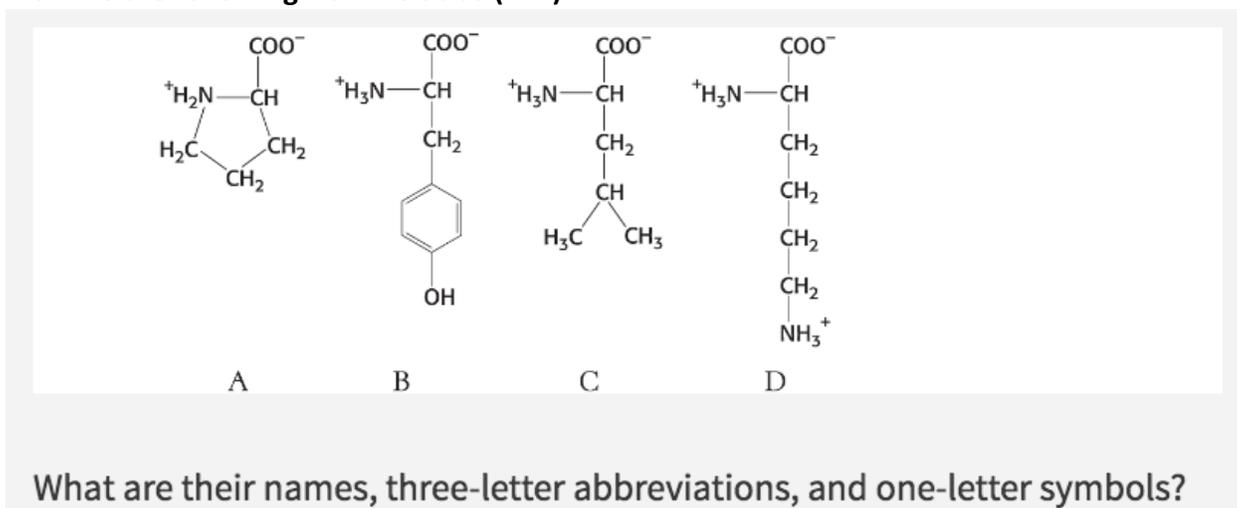


CHEM523 Homework 1

Answer the following questions on your Rocketbook pages and send me your answers by Friday, 3 September by midnight. Late submissions will not be accepted. Be certain to include your name on every page in the top right hand corner.

1) Examine the following 4 amino acids (A-D).

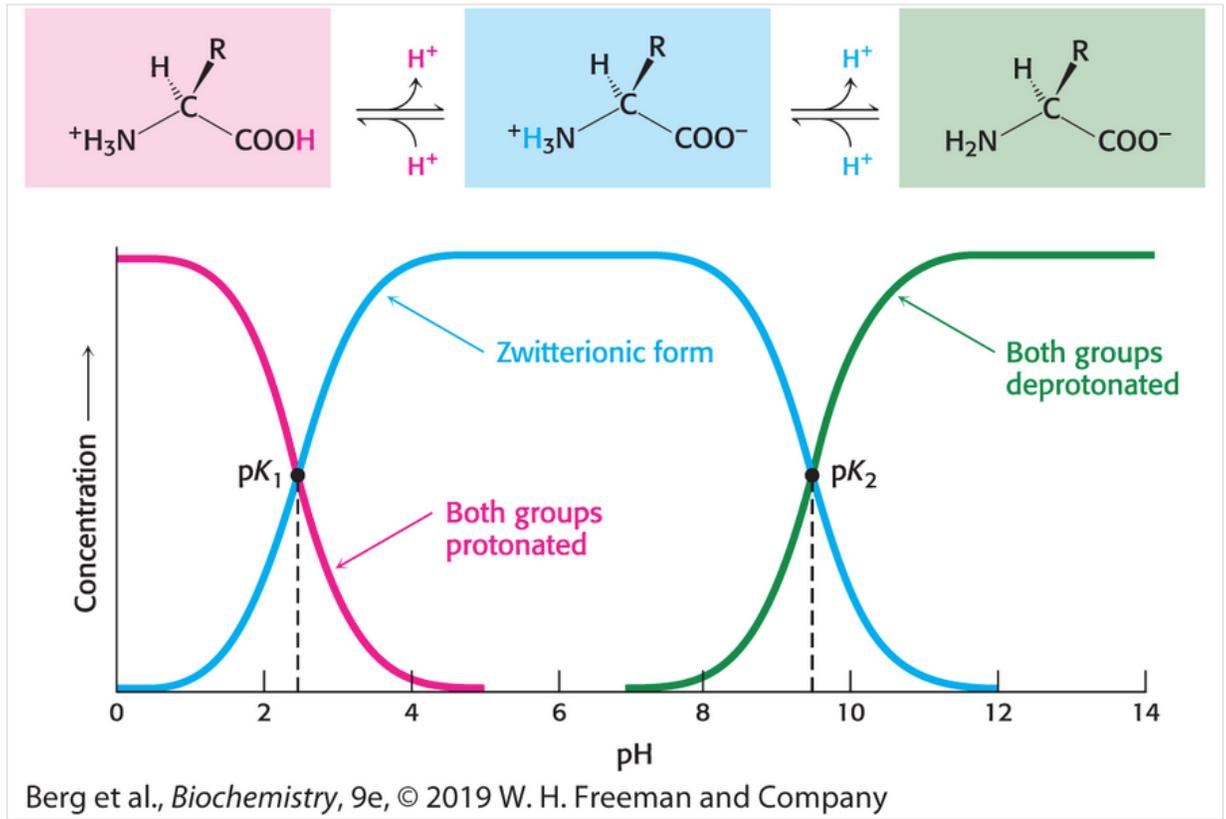


2) In reference to the amino acids shown in problem 1, which are associated with the following characteristics?

- Hydrophobic side chain _____
- Basic side chain _____
- Three ionizable groups _____
- pK_a of approximately 10 in proteins _____
- Modified form of phenylalanine _____

3) Draw the structure of the dipeptide Gly-His. What is the charge on the peptide at pH 5.5? pH 7.5?

- 4) The figure below (Figure 2.6 from your textbook) depicts the species profile for an amino acid, which carries a neutral side chain (e.g., alanine or glycine). What would this graph look like for histidine, assuming the pKa of its carboxylic acid is 1.8, the pKa of its amino group is 9.3, and the pKa of its side chain is 6.0?



- 5) List the four intermolecular forces in order from highest energy to lowest energy.