

Problem Set 5

1. Serine has pKa's of 2.21 and 9.15. For a solution with a pH of 10.50, draw the complete Lewis structures and calculate the ratio of the two most prevalent forms of serine; clearly show which form is present at higher concentration.
2. Tyrosine has pKa 's of 2.20, 9.11, and a side chain pKa of 10.07.
 - a. For pH's of 3.20 and 4.20 respectively, calculate the ratio for the two most concentrated forms that are present and draw the Lewis structures (OK to use a ring representation as was done in class for the aromatic portion of this molecule) for these forms.
 - b. Draw the Lewis structures for the two most concentrated forms present at a pH of 8.11.
 - c. Draw the Lewis structures for the most concentrated form present at a pH of 11.
3. Lysine has pKa's of 2.18, 8.95, and 10.53 (side chain).
 - a. Draw the complete Lewis structure of lysine that is most prevalent at physiological pH.
 - b. Draw the complete Lewis structures and calculate the ratio of the two most prevalent forms of lysine at a pH of 1.0.

