**Name: Period: Seat#:**

**Worksheet #5**

**Directions:** Show all work. Box your final answer.   
*\*Remember – lots of ways to do these. If you get the right answer and someone can follow your work and units etc. then you are FINE!*

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| 1. A buffer is prepared containing 1.00 molar acetic acid and 1.00 molar sodium acetate. What is its pH? *4.752 Ka = 1.76 x 10-5* | 1. A buffer is prepared containing 1.00 molar acetic acid and 0.800 molar sodium acetate. What is its pH? *4.655 Ka = 1.76 x 10-5* | |
| 1. A buffer is prepared containing 0.600 M anisic acid and 0.800 M sodium anisate. What is its pH? *4.596 Ka = 3.38 x 10-5* | 1. A buffer is prepared containing 1.00 M ammonia and 1.00 M ammonium chloride. What is its pH? *9.248 Kb = 1.8 x 10-5* | |
| 1. A buffer is prepared containing 1.00 M ammonia and 0.800 M ammonium chloride. What is its pH? *9.345 Kb = 1.8 x 10-5* | 1. A buffer is prepared containing 0.600 M nicotine and 0.800 M nicotine hydrochloride. What is its pH? *7.896 Nicotine is a base. pKa = 8* | |
| 1. pKa for phenolphthalein is 9.3 at room temperature.    1. Calculate ratio of its anionic form to acid form at pH 8.2 and then again at pH 10. *At pH 8.2 = ratio of base form to acid form = 0.0794 to 1  At pH 10 = ratio of base form to acid form = 5.01 to 1* | | * 1. Using these values, explain the color change within this pH range from 8.2 – 10 |
| **8)\*** Calculate the pH of the solution that results from the addition of 0.040 moles of HNO3 to a buffer made by combining 0.500 L of 0.380 M HC3H5O2 (Ka = 1.30 x 10−5) and 0.500 L of 0.380 M NaC3H5O2  *pH = 4.700* *\*Assume addition of the nitric acid has no effect on volume.* | 1. What is the pH when 25.0 mL of 0.200 M of CH3COOH has been titrated with 35.0 mL of 0.100 M NaOH? (Ka = 1.8 x 10-5) *pH = 5.11*   *(\*hint\* Think about how much A- is formed when mol HA + mol OH- react. Then think about if you have [HA] and [A-] left over that you can uses with the He-Ha equation!)* | |
| 1. A beaker with 100.0 mL of an acetic acid buffer with a pH of 5.000 is sitting on a benchtop. The molarity of acid is 0.100 M and the molarity of the conjugate base in this buffer is 0.100 M. A student adds 7.300 ml of a 0.3600 M HCl solution to the beaker. How much will the pH change? The pKa of acetic acid is 4.752. *pH = 4.518* |
| 1. Calculate the ratio of CH3NH2 to CH3NH3Cl required to create a buffer with pH = 10.14  The pKb of CH3NH2 = 3.357 *base/acid ratio = 0.314* | |