**Dougherty Valley HS AP Chemistry**

**WORKSHEET #4**

**Acid Base – Henderson-HasselBalch**

**Name: Date: Period: Seat #:**

Show all work for each question, box your final answer

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| A buffer is prepared containing 1.00 molar acetic acid and 1.00 molar sodium acetate. What is its pH? (4.752) | A buffer is prepared containing 1.00 molar acetic acid and 0.800 molar sodium acetate. What is its pH? (4.655) |
| A buffer is prepared containing 0.600 molar anisic acid and 0.800 molar sodium anisate. What is its pH? (4.596) | A buffer is prepared containing 1.00 molar ammonia and 1.00 molar ammonium chloride. What is its pH? (9.248) |
| A buffer is prepared containing 1.00 molar ammonia and 0.800 molar ammonium chloride. What is its pH? (9.345) | A buffer is prepared containing 0.600 molar nicotine and 0.800 molar nicotine hydrochloride. What is its pH? (7.896) |
| pKa for phenophthalein is 9.3 at room temp. | 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. |
| a) Calculate ratio of its anionic form to acid form at pH 8.2 and at pH 10. (pH 8.2 = ratio of base form to acid form = 0.0794  to 1 (call it 8 to 100, pH 10 = ratio of base form to acid form = 5.01 to 1 (call it 500 to 100)) |
| b) Using these values, explain the colour change within this pH range. |
| 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? (pH = 5.120) | A beaker with 100.0 mL of an acetic acid buffer with a pH of 5.000 is sitting on a benchtop. The total molarity of acid  and conjugate base in this buffer is 0.1000 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) |
| Calculate the ratio of CH3NH2 to CH3NH3Cl required to create a buffer with pH = 10.14 (base/acid ratio = 0.313) |  |