Dougherty Valley HS Chemistry - AP
Acid Base – Study Questions 2

Worksheet #10

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

Directions: Show all work. Box your final answer.

1) Calculate the equilibrium constant, Kneut for the neutralization of hydrocyanic acid by ammonia: *0.72*

$$\mathbf{HCN(aq) + NH_3(aq) \Leftrightarrow NH_4^+(aq) + CN^-(aq)}$$

K_a for hydrocyanic acid = 4.0×10^{-10} at 25°C, K_b for ammonia = 1.8×10^{-5} at 25°C

2) If exactly 50 mL of a 0.050M solution of hydrochloric acid is added to exactly 50 mL of 0.050M ammonia, what is the pH of the resulting solution? *5.43*

3) **a)** What is the pH of 100 mL of pure water at 25° C? Use the Kw to show how this is true. *7.0*

b) What would the pH of this 100 mL water sample be if 0.10 mL of 12M HCl was added to it? (Assume the volume doesn't change). *1.92*

c) Calculate the pH of a buffer solution composed of 0.20M ammonia and 0.20M ammonium chloride. *9.26*

d)* Calculate the pH of 100 mL of this buffer solution if 0.10mL of 12M hydrochloric acid is added to it. (Assume the volume doesn't change). *9.2*

4) A solution contains KH_2PO_4 and K_2HPO_4 and has a pH of 7.10. What is the mole ratio of K_2HPO_4 to KH_2PO_4? Ka = 6.17×10^{-8} *0.776 : 1*