AP Chemistry (A/B Test cont.) Name_____

Part III

1)A 25 mL sample of 0.20 M HF is titrated with a 0.20 M NaOH. Determine the pH of the solution after the addition of each quantity of the NaOH given below: $K_a=6.8 \times 10^{-4}$

a) 20.0 mL NaOH pH=_____

b) 25.0 mL NaOH pH=_____

c) 30.0 mL NaOH pH=_____

2)What is the pH of a buffer solution that is 0.20 M CH_3NH_2 and 0.30 M CH_3NH_3Cl? The K_b for CH_3NH_2 is 4.4×10^{-4}.

3) One liter of a buffer solution contains 0.120 mole of benzoic acid, and 0.105 mol of sodium benzoate. What is the pH of the buffer before and after the addition of 0.011 mol of NaOH? The pK_a of benzoic acid is 4.20

Before_____After_____

4)

a) Arrange the acids from strongest to weakest.

H_2CO_3
H_3BO_3
$HClO_3$
H_2SO_3

b) Arrange the bases from strongest to weakest.

NH_2CH_3 $K_b = 4.0 \times 10^{-4}$
ClO^- $K_a = 3.0 \times 10^{-8}$
CO_3^{-2} $K_a = 5.6 \times 10^{-11}$
HS^- $K_a = 9.5 \times 10^{-8}$

Formulas:

$$pH = pK_a + \log \frac{[\text{conj base}]}{[\text{acid}]}$$

$$pOH = pK_b + \log \frac{[\text{conj acid}]}{[\text{base}]}$$