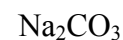


## CHEMISTRY 12 – HYDROLYSIS & TITRATIONS EXTRA PRACTICE

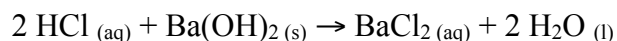
- 1) What is the net ionic equation for the hydrolysis of  $\text{NH}_4\text{ClO}_4$ ? **(1 mark)**
- 2) What is the equilibrium constant expression for the predominant reaction between the hydrogen oxalate ion,  $\text{HC}_2\text{O}_4^-$ , and water? **(1 mark)**
- 3) Which of the following is true as a result of the predominant hydrolysis of  $\text{NaHCO}_3$ ? **(1 mark)**

	Solution	Reason
A.	basic	$K_a > K_b$
B.	basic	$K_b > K_a$
C.	acidic	$K_a > K_b$
D.	acidic	$K_b > K_a$

- 4) Which of the following represents a basic salt solution? **(1 mark)**



- 5) A chemist prepares a solution by dissolving the salt  $\text{NaIO}_3$  in water.
  - a) Write the equation for the dissociation reaction that occurs. **(1 mark)**
  - b) Write the equation for the hydrolysis reaction that occurs. **(1 mark)**
  - c) Calculate the value of the equilibrium constant for the hydrolysis in part b). **(1 mark)**
- 6) Calculate the pH of 0.50 M NaF. **(5 marks)**
- 7) Calculate the initial concentration of an  $\text{NH}_4\text{Cl}$  salt solution that has a pH = 4.80. Begin by writing the equation for the predominant equilibrium reaction. **(5 marks)**
- 8) Consider the following reaction:



When 3.16 g samples of  $\text{Ba}(\text{OH})_2$  were titrated to the equivalence point with an HCl solution, the following data were recorded:

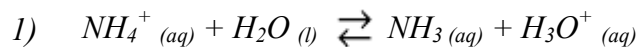
	Volume of HCl added
Trial 1	37.80 mL
Trial 2	35.49 mL
Trial 3	35.51 mL

Using the data, calculate the original [HCl].  
**(4 marks)**

9) A 25.0 mL sample of the weak acid  $H_2S$  is titrated with 38.2 mL of 0.20 M KOH (a strong base). What is the concentration of the acid? (3 marks)

10) What mass of NaOH (s) is required to just neutralize 50.0 mL of 2.0 M  $H_2SO_4$ ? Begin by writing the balanced equation for the neutralization reaction. (3 marks)

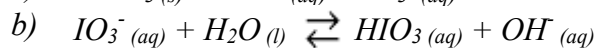
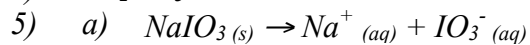
Solutions:



2) 
$$K_a = \frac{[C_2O_4^{2-}][H_3O^+]}{[HC_2O_4^-]}$$

3) B

4)  $Na_2CO_3$



c)  $K_b = 5.9 \times 10^{-14}$

6) 8.58

7) 0.45 M

8) 1.04 M

9) 0.15 M

10) 8.0 g