

Titration Analysis Extra Practice

1. In a titration of 20.0mL ammonium chloride with 1.4M barium hydroxide, the following results were obtained from the experiment:

Table 1: Titration Results for the Titration of 20.0mL NH₄Cl with 1.4M Ba(OH)₂

	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6
Initial Buret Volume (mL)	0.00mL	18.26mL	32.89mL	2.10mL	17.08 mL	32.09 mL
Final Buret Volume (mL)	18.26mL	32.89mL	47.44mL	17.08 mL	32.09 mL	46.67 mL
Change in Volume of Titrant (mL)						

- a. Complete the chart
- b. Determine the average volume of titrant used in this lab _____
- c. Determine the balanced equation for the titration described. List givens and unknowns under your balanced equation.
- d. Using stoichiometry, determine the concentration of ammonium chloride from this titration.
- e. Determine an appropriate indicator for use on this titration and draw the titration curve (remember how the mole ration influences your curve!)
- f. If the concentration of ammonium chloride was 2.5mol/L, determine the %error in these titration results.

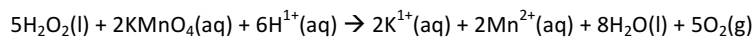
2. In a titration of 10.0mL of sodium fluoride with 0.50M benzoic acid (C_6H_5COOH), the following results were obtained from the experiment:

Table 1: Titration Results for the Titration of 10.0mL NaF(aq) with 0.50M C_6H_5COOH (aq)

	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6
Initial Buret Volume (mL)	0.00mL	11.80mL	23.42mL	34.63mL	10.20mL	21.97mL
Final Buret Volume (mL)	11.80mL	23.42mL	34.63mL	46.41mL	21.97mL	33.66mL
Change in Volume of Titrant (mL)						

- Complete the chart
- Determine the average volume of titrant used in this lab _____
- Determine the balanced equation for the titration described. List givens and unknowns under your balanced equation.
- Using stoichiometry, determine the concentration of sodium fluoride from these titration results
- Determine an appropriate indicator for use on this titration and draw the titration curve (remember how the mole ration influences your curve!)
- Determine the mass of benzoic acid required to create a 200.0mL of 0.50M solution used in this titration.

3. A student performed a titration of 0.50g of 30% H_2O_2 solution with purple 0.02mol/L KMnO_4 in Acid according to the following chemical reaction:



The titration results are provided below:

Table 1: Titration Results for the Titration of 0.50g $\text{H}_2\text{O}_2(\text{l})$ with 0.02M $\text{KMnO}_4(\text{aq})$

	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6
Initial Buret Volume (mL)	2.00mL	11.90mL	23.89mL	35.77mL		
Final Buret Volume (mL)	11.90mL	23.89mL	35.77mL	47.63mL		
Change in Volume of Titrant (mL)						

- Why did the student stop at 4 trials and not continue with trial 5 or 6???
- Determine the average volume change for the titration results _____
- Using stoichiometry, calculate the number of grams of $\text{H}_2\text{O}_2(\text{l})$ for the average of the titration.
- Using the calculated mass (from above) and the mass of the solution (0.50g), calculate the percent mass of H_2O_2 in the solution
- If the solution provided is 3%, determine the percent error of this titration.

- Determine the general variables for all titrations.

Controlled variables (minimum 3)

- What must you always keep the same between all trials?

Manipulated variable

- What are you doing to cause a change or reaction in the experiment?

Responding variable (minimum 3)

- What are you looking for? What observations will you note?

- Why is it permissible to add water to the flask to wash down the sides while performing titration? Will this not alter the concentration of the substance being tested? Explain..

- Now how are you feeling about titrations?