Virtual Experiment 12

Name _____

Laboratory Report

A. Standardization of sodium hydroxide solution

Part 1. Simulation of titration of KHP with sodium hydroxide

		Trial 1	Trial 2
1.	Volume of 0.500 M KHP solution us	_____	_____
2.	Volume of ~ 1 M solution of NaOH used	_____	_____
3.	Moles of KHP	_____	_____
4.	Moles of NaOH	_____	_____
5.	Molarity of NaOH	_____	_____

Show calculations

Part 2. Titration of solid KHP with sodium Hydroxide solution with Class Data:

		Trial __	Trial __	Trial __
1.	mass of KHP added	_____	_____	_____
2.	Molar Mass of KHP	_____		
3.	moles of KHP added	_____	_____	_____

4. Balanced chemical reaction and molar ratio between NaOH and KHP

5.	Moles of NaOH at equivalence point	_____	_____	_____
6.	Volume of NaOH used in titration of KHP			
	Volume added	_____	_____	_____

7. Molarity of NaOH solution _____ _____ _____

8. Average Molarity of NaOH _____ _____ _____ _____ _____

9. Average Deviation _____ _____ _____ _____

10. Percent error between calculated molarity and average molarity
If you did not prepare your own NaOH solution, assume 0.2 M. _____ _____ _____

B. Analysis of vinegar

Part 1. Simulation of Vinegar titration:

		Trial 1	Trial 2
1.	Volume of concentrated Vinegar Solution	_____	_____
2.	Mass of Vinegar Solution	_____	_____
3.	Volume of diluted Vinegar solution used in titration	_____	_____
4.	Molarity of Standardized NaOH solution	_____	_____
5.	Volume of NaOH solution added to diluted Vinegar	_____	_____
6.	Molarity of original Vinegar solution	_____	_____
7.	Mass of acetic acid in Vinegar solution	_____	_____
8.	%mass of Vinegar solution	_____	_____
9.	Show calculations		

Part 2. Report of class data:

		Trial 1	Trial 2	Trial 3
1.	mass of 10.00 mL Vinegar			
2.	Volume of Vinegar solution			
3.	Density of Vinegar solution			
4.	Volume of NaOH needed to titrate Vinegar solution			
	Volume added			
5.	Average Molarity of NaOH solution from Part A.			
6.	moles of NaOH reacted			
7.	Balanced chemical reaction and molar ratio between NaOH and Acetic Acid in Vinegar			
8.	Moles of Acetic acid			
9.	Molarity of Acetic acid in Vinegar			
10.	Average Molarity of Acetic Acid solution			
11.	Molar Mass of Acetic Acid			
12.	Mass of Acetic Acid in sample			
13.	% mass of acetic acid solution			
14.	Average % mass			
15.	Percent error of % mass (assume 5% solution of vinegar)			

16. Titrations are very common in the determination of substances in solution. What are the criteria for using titration analysis for a chemical reaction?

17. Explain why we used titration analysis for this reaction rather than the previous technique of gravimetric analysis (collection and weighing a solid product)

18. What is the purpose of the indicator in the reaction?

19. The end point of a titration is generally considered to be the stoichiometric equivalence point for the reaction. What error is inherent in this assumption?