

Regents Chemistry: Titration Problems

Name: _____ Date: _____

Show all work for the following problems and report answers to the appropriate number of significant figures.

1. 18.0 mLs of 1.5 M HCl neutralizes 54.0 mLs of NaOH. What is the molarity of the NaOH solution?
2. 45 mLs of 0.30 M NaOH is needed to titrate 54 mLs of HNO₃. What is the molarity of the HNO₃?
3. How many mLs of 0.20 M KOH are needed to titrate 40 mLs of 0.10 M HNO₃?
4. How many milliliters of 0.050 M HCl are needed to exactly neutralize 30 mLs of 0.10 M Ba(OH)₂?
5. How many mLs of 0.40 M Ba(OH)₂ are needed to titrate 25 mLs of 0.50 M H₂SO₄?

1. A student recorded the following buret readings during a titration of a base with an acid:

	Standard 0.100 M HCl	Unknown KOH
Initial reading	9.08 mL	0.55 mL
Final reading	19.09 mL	5.56 mL

- a Calculate the molarity of the KOH. Show all work.
b Record your answer to the correct number of significant figures.

Base your answers to questions 2 through 5 on the information and data table below.

A titration setup was used to determine the unknown molar concentration of a solution of NaOH. A 1.2 M HCl solution was used as the titration standard. The following data were collected.

	Trial 1	Trial 2	Trial 3	Trial 4
Amount of HCl Standard Used	10.0 mL	10.0 mL	10.0 mL	10.0 mL
Initial NaOH Buret Reading	0.0 mL	12.2 mL	23.2 mL	35.2 mL
Final NaOH Buret Reading	12.2 mL	23.2 mL	35.2 mL	47.7 mL

2. Calculate the volume of NaOH solution used to neutralize 10.0 mL of the standard HCl solution in trial 3. Show your work.
3. According to Reference Table M, what indicator would be most appropriate in determining the end point of this titration? Give one reason for choosing this indicator.
4. Calculate the average molarity of the unknown NaOH solution for all four trials. Your answer must include the correct number of significant figures and correct units.
5. Explain why it is better to use the average data from multiple trials rather than the data from a single trial to calculate the results of the titration.