

CHAPTER 8	Titration Problems	BLM 8.3.3
ASSESSMENT		

1. (a) Use a diagram to illustrate the neutralization of sulfuric acid with sodium hydroxide. Use H^+ and OH^- in your illustration.
- (b) According to the diagram, how many moles of sodium hydroxide must be present to neutralize 1 mol of sulfuric acid?
- (c) How many moles of phosphoric acid are required to neutralize 7.2 mol of potassium hydroxide?
2. A 17.85 mL volume of nitric acid neutralizes 25.00 mL of 0.150 mol/L sodium hydroxide. What is the concentration of the nitric acid when the pH is exactly 7.0?
3. A 25.0 mL sample of sulfuric acid is completely neutralized by adding 32.8 mL of 0.116 mol/L ammonia solution. Ammonium sulfate is formed. What is the concentration of the sulfuric acid?
4. The following data were collected during a titration. Calculate the concentration of the sodium hydroxide solution.

Volume of HCl(aq)	10.00 mL
Initial volume of NaOH(aq)	23.08 mL
Final volume of NaOH(aq)	1.06 mL
Concentration of HCl(aq)	0.235 mol/L

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5. What volume of 0.250 mol/L sulfuric acid is needed to react completely with 37.2 mL of 0.650 mol/L potassium hydroxide?
6. It is found that 42.5 mL of 1.02 mol/L NaOH have been added to 50.0 mL of vinegar (ethanoic acid) when the phenolphthalein in the solution just turns pink. What is the concentration of the vinegar?
7. A student conducts three trials to determine the concentration of barium hydroxide. The titrant used is a 0.250 mol/L hydrochloric acid solution. Each sample of barium hydroxide is 10.00 mL. Calculate the concentration of the barium hydroxide for each trial. What is the average concentration of barium hydroxide?

Trial #	1	2	3
Final volume HCl(aq) (mL)	37.32	24.56	11.78
Initial volume HCl(aq) (mL)	50.00	37.32	24.56