

Strong Acid/Strong Base Titration Problem Set

This problem set was developed by [S.E. Van Bramer](#) for [Chemistry 146](#) at [Widener University](#).

1. A sodium hydroxide solution of unknown concentration is titrated against 0.8765 g KHP (Potassium acid phalate, a monoprotic acid, MW 204.3 g/mol). 48.6 mL of the sodium hydroxide solution is required to reach the endpoint of the titration. What is the concentration of the unknown sodium hydroxide solution?
2. This sodium hydroxide solution is then used to titrate an unknown nitric acid sample. 25.0 mL of the nitric acid solution is titrated. 32.8 mL of the sodium hydroxide solution is required to reach the endpoint. What is the concentration of the nitric acid solution?
3. Calculate the pH at the following points in the titration of the unknown nitric acid sample.
 - a. 0 mL of sodium hydroxide solution added.
 - b. 1 mL of sodium hydroxide solution added.
 - c. 5 mL of sodium hydroxide solution added.
 - d. 10 mL of sodium hydroxide solution added.
 - e. 20 mL of sodium hydroxide solution added.
 - f. 30 mL of sodium hydroxide solution added.
 - g. 32.8 mL of sodium hydroxide solution added.
 - h. 35 mL of sodium hydroxide solution added.
 - i. 40 mL of sodium hydroxide solution added.
 - j. 50 mL of sodium hydroxide solution added.