

# ACID-BASE TITRATION

Name \_\_\_\_\_

To determine the concentration of an acid (or base), we can react it with a base (or acid) of known concentration until it is completely neutralized. This point of exact neutralization, known as the endpoint, is noted by the change in color of the indicator.

We use the following equation:

$$N_A \times V_A = N_B \times V_B \quad \text{where } N = \text{normality} \\ V = \text{volume}$$

Solve the problems below.

1. A 25.0 mL sample of HCl was titrated to the endpoint with 15.0 mL of 2.0 N NaOH. What was the normality of the HCl? What was its molarity?

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2. A 10.0 mL sample of  $\text{H}_2\text{SO}_4$  was exactly neutralized by 13.5 mL of 1.0 M KOH. What is the molarity of the  $\text{H}_2\text{SO}_4$ ? What is the normality?

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3. How much 1.5 M NaOH is necessary to exactly neutralize 20.0 mL of 2.5 M  $\text{H}_3\text{PO}_4$ ?

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4. How much of 0.5 M  $\text{HNO}_3$  is necessary to titrate 25.0 mL of 0.05 M  $\text{Ca}(\text{OH})_2$  solution to the endpoint?

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5. What is the molarity of a NaOH solution if 15.0 mL is exactly neutralized by 7.5 mL of a 0.02 M  $\text{HC}_2\text{H}_3\text{O}_2$  solution?

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