

Titration Self-Check Questions

1. What is the approximate pH of a solution that is:
 - a. yellow in methyl red, yellow in phenol red, and yellow in alizarin yellow?
 - b. yellow in methyl red, red in phenol red, and red in alizarin yellow?
2. Write the general word equation for a neutralization reaction.
3. Write **balanced** neutralization reactions for the following:
 - a. the reaction between acetic acid, $\text{HC}_2\text{H}_3\text{O}_2$ and potassium hydroxide, KOH
 - b. the reaction between nitric acid, HNO_3 and calcium hydroxide, $\text{Ca}(\text{OH})_2$
 - c. the reaction between sulfuric acid, H_2SO_4 , and sodium hydroxide, NaOH

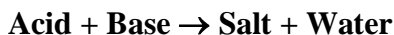
4. If 25.00 mL of a 0.100 M NaOH solution is required to neutralize 15.00 mL of a solution of HCl, what is the molarity of the acid?
5. What is the concentration of a calcium hydroxide solution, $\text{Ca}(\text{OH})_2$, if 30.00 mL of the base is completely neutralized by 10.0 mL of 0.0200 M HCl?

Answer Key

1. What is the approximate pH of a solution that is:

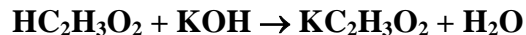
- a. yellow in methyl red, yellow in phenol red, and yellow in alizarin yellow? **6.0 – 6.6**
- b. yellow in methyl red, red in phenol red, and red in alizarin yellow? **12 or higher**

2. Write the general word equation for a neutralization reaction.

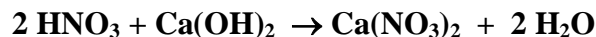


3. Write **balanced** neutralization reactions for the following:

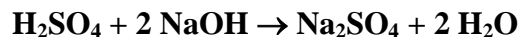
- a. the reaction between acetic acid, $\text{HC}_2\text{H}_3\text{O}_2$ and potassium hydroxide, KOH



- b. the reaction between nitric acid, HNO_3 and calcium hydroxide, Ca(OH)_2



- c. the reaction between sulfuric acid, H_2SO_4 , and sodium hydroxide, NaOH



4. If 25.00 mL of a 0.100 M NaOH solution is required to neutralize 15.00 mL of a solution of HCl, what is the molarity of the acid?

The concentration of the HCl solution is 0.167 M.

5. What is the concentration of a calcium hydroxide solution, Ca(OH)_2 , if 30.00 mL of the base is completely neutralized by 10.0 mL of 0.0200 M HCl?

The concentration of the Ca(OH)_2 solution is 3.33×10^{-3} M.