Neutralization Worksheet #1 – CH40S

1. If it takes 54 mL of 0.1 M NaOH to neutralize 125 mL of an HCl solution, what is the concentration of the HCl?

2. If it takes 25 mL of 0.05 M HCl to neutralize 345 mL of NaOH solution, what is the concentration of the NaOH solution?

3. If it takes 50 mL of 0.5 M KOH solution to completely neutralize 125 mL of sulfuric acid solution (H_2SO_4), what is the concentration of the H_2SO_4 solution?

4. What is the concentration of a hydrochloric acid solution if 35.00 mL of it are exactly neutralized by 14.8 mL of a 0.500 M sodium hydroxide solution?

5. What volume of 0.500 M hydrochloric acid is required to exactly neutralize 40.00 mL 0.150 M NaOH?

6. What volume of 2.500 M NaOH solution is required to neutralize 25.5 mL of a 1.200 M HNO_3 solution?

7. What is the concentration of a sodium hydroxide solution if 14.5 mL of it are exactly neutralized by 30.0 mL of a 0.500 M hydrochloric acid solution?

8. Phosphoric acid is neutralized by potassium hydroxide according to the following reaction:

   $KOH\ (aq) + H_3PO_4\ (aq) \rightarrow K_3PO_4\ (aq) + H_2O\ (l)$

   What is the concentration of a phosphoric acid solution if 25.0 mL are exactly neutralized by 20.0 mL of 2.000 M KOH solution?

9. Hydrochloric acid is neutralized by calcium hydroxide according to the following reaction:

   $Ca(OH)_2\ (aq) + 2\ HCl\ (aq) \rightarrow CaCl_2(aq) + 2\ H_2O\ (l)$

   What is the concentration of a calcium hydroxide solution if 15.0 mL are exactly neutralized by 10.00 mL of 0.250 M HCl solution?

10. Acid spills are often neutralized with sodium carbonate. For example

    $Na_2CO_3\ (s) + H_2SO_4\ (aq) \rightarrow Na_2SO_4\ (aq) + CO_2\ (g) + H_2O\ (l)$

    An instructor dropped a 2.50 L bottle of 18.0 M H_2SO_4 on a cement floor. How much sodium carbonate would be required to neutralize it?