**Neutralization Worksheet**

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 (H2SO4), what is the concentration of the H2SO4 solution?
4. What is the concentration of a hydrochloric acid solution if 35.00 mL of it are exactly neutralized by 14.8 mLof a 0.500 M sodium hydroxide solution?
5. What volume of 0.500 M hydrochloric acid is required to exactly neutralize 40.00 mL0.150 M NaOH?
6. What volume of 2.500 M NaOH solution is required to neutralize 25.5 mL of a 1.200 M HNO3 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) +   H3PO4 (aq)   🡪  K3PO4 (aq)   +  H2O  (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?

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

Ca(OH)2 (aq)  +  2 HCl(aq)   🡪 CaCl2(aq)   +  2 H2O  (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?

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

Na2CO3 (s)  +  H2SO4 (aq)  🡪   Na2SO4 (aq)  +   CO2 (g)   +  H2O  (l)

An instructor dropped a 2.50 Lbottle of 18.0 M H2SO4 on a cement floor.  How much sodium carbonate would be required to neutralize it? Answer in kg.