

1. Suppose 250 ml of 1M HCl solution is neutralized with 500 ml of 0.5M NaOH solution. What is the concentration of the NaCl in the resulting solution? If it is evaporated to dryness, what mass of NaCl is obtained?
2. What volume of 0.100M HCl is required to react completely with 5.00 grams of calcium hydroxide?
3. What volume of 0.124M hydrobromic acid solution is required to neutralize 25.00 ml of 0.107M sodium hydroxide solution?
4. Javex is a solution of sodium hypochlorite and sodium hydroxide, obtained by passing chlorine into sodium hydroxide solution. How many grams of sodium hypochlorite could be obtained by passing chlorine into 3.00 L of 1.52M sodium hydroxide solution?
5. What volume of 0.50 M sulfuric acid is needed to react completely with 10.0 ml of 2.0 M potassium hydroxide?
6. A stockroom supply of concentrated sulfuric acid is 95.0% hydrogen sulfate by mass and has a density of 1.84 g/ml. How many milliliters of concentrated sulfuric acid are required to prepare 200.0 ml of 0.200M sulfuric acid solution?
7. Ammonia,  $\text{NH}_3$ , is a gas that reacts with water to form ammonium hydroxide. If 500.0 ml of ammonia at 27°C and 795 mm of Hg is dissolved to make 100.0 ml of solution, how many milliliters of 0.25M phosphoric acid would be required to react with all of the ammonium hydroxide?
8. 50.0 ml of 0.010 M acetic acid will neutralize 65.0 ml of potassium hydroxide. What is the concentration of the base?
9. Concentrated hydrochloric acid reacts with manganese (IV) oxide to produce chlorine, manganese (II) chloride and water. What volume of 12.0 M hydrochloric acid is needed to produce 20.0 L of chlorine gas at 104.5 kPa and 25.0°C?
10. An unknown amount of potassium chlorate is heated until no more oxygen was evolved. 15.824 g of potassium chloride remained in the test tube. What mass of potassium chlorate had originally been placed in the tube? What volume of oxygen gas was evolved at STP during the experiment?