Molarity Review

1. Calculate the molarity of the following solutions.
   a) 1.00 L of a solution contains 0.260 mol of hydrochloric acid.
   b) 250.0 mL of a solution contains 25.0 g of sodium chloride.
   c) 600.0 mL of a solution contains 1.50 g of calcium carbonate.
   d) 325 mL of a solution contains 10.0 g of chromium(III) nitrate nonahydrate.
   e) 50.0 mL of a solution contains 15.6 g of ammonium sulfate.

2. How would you prepare the following solutions?
   a) 1.00 L of 3.00 M ammonium chloride.
   b) 500.0 mL of 0.250 mol/L mercury(II) nitrate.
   c) 125.0 mL of 0.500 kmol/m^3 barium nitrate.
   d) 250.0 cm^3 of 0.100 mol/dm^3 antimony(III) chloride.

3. What volume of 2.40 kmol/m^3 aluminum chloride can be made from 100.0 g of aluminum chloride?

4. What volume of 2.80 x 10^{-2} M sodium fluoride contains 0.150 g of sodium fluoride?

5. If 20.0 mL of 0.750 mol/dm^3 hydrobromic acid is diluted to a final volume of 90.0 mL, what is the molar concentration of the hydrobromic acid in the resulting solution?

6. What is the molar concentration of the potassium hydroxide solution resulting from the mixture of 50.0 mL of 0.150 M potassium hydroxide and 75.0 mL of 0.250 M potassium hydroxide?

7. If one drop (0.0500 mL) of 0.200 kmol/m^3 sodium bromide is added to 100.0 mL of water, what is [NaBr] in the resulting solution.

8. The density of pure water at 4°C is 1.00 kg/L. What is the molar concentration of water in pure water?

9. Concentrated nitric acid is 15.4 kmol/m^3. How would you prepare 2.50 L of 0.375 kmol/m^3 nitric acid?

10. If 300.0 mL of solution A contains 25.0 g of potassium chloride and 250.0 mL of solution B contains 60.0 g of potassium chloride, what is the molar concentration of the potassium chloride solution resulting from the mixture of solutions A and B?

*11. Solution A is 0.475 M sodium hydroxide. Solution B also contains sodium hydroxide. When 250.0 mL of solution A is mixed with 400.0 mL of solution B, the resulting solution is 0.325 M sodium hydroxide. What is the molar concentration of solution B?

*12. Solution X is 0.135 M sodium chloride. Solution Y also contains sodium chloride. When 55.0 mL of solution X is mixed with 125 mL of solution Y, the resulting solution is 0.165 M sodium chloride. How many grams of sodium chloride are contained in 300.0 mL of solution Y?

*13. Solution X is 0.125 M barium nitrate and solution Y is 1.50 M barium nitrate. What volume of solution Y must be added to 250.0 mL of solution X in order to produce a 0.500 M barium nitrate solution.