Chapter 4: Worksheet #1 Mass Relationships Molarity

1. Calculate the molarity of a 184.6 mg sample of potassium dichromate if it is dissolved in enough water to give 500.0 mL of solution.

0.001255 M $K_2Cr_2O_7$

2. Calculate the mass of sodium hydroxide in 250.0 mL of a 0.4000 M solution.

4.000 g NaOH

3. How would you prepare 1.0 L of a 0.50 M solution of sulfuric acid from concentrated (18 M) sulfuric acid?

28 mL H_2SO_4 diluted to 1.0 L with H_2O

4. A 0.4508 g sample of iron is dissolved in a small amount of concentrated nitric acid forming Fe^{3+} ions in solution. It is then diluted to a total volume of 500.0 mL. Calculate the molarity of the Fe^{3+} solution.

0.01614 M Fe^{3+}

5. Environmental chemists commonly use the unit of parts per million (ppm) when referring to aqueous solutions. 1 ppm means 1 part of solute for every 10^6 parts of solution or:

$$\text{ppm} = \frac{\mu\text{g solute}}{\text{g solution}} = \frac{\text{mg solute}}{\text{kg solution}} = \frac{\text{mg solute}}{\text{L of dilute, aqueous solution}}$$

Calculate the molarity of a solution with 0.10 ppm DDT ($C_{14}H_9Cl_5$) in water.

2.8×10^{-7} M DDT