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.

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

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

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.

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:

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

Calculate the molarity of a solution with 0.10 ppm DDT ($C_{14}H_{9}Cl_5$) in water.