Molarity Calculations

Calculate the molarities of the following solutions:

1) 2.3 moles of sodium chloride in 0.45 liters of solution.

$$\frac{2.3 \text{ mol}}{0.45 \text{ L}} = 5.1 \text{ M}$$

2) 1.2 moles of calcium carbonate in 1.22 liters of solution.

$$\frac{1.2 \text{ mol}}{1.22 \text{ L}} = 0.98 \text{ M}$$

3) 0.09 moles of sodium sulfate in 12 mL of solution.

$$\frac{0.09 \text{ mol}}{.012 \text{ L}} = 8 \text{ M}$$

4) *How many grams of HCl are needed to make* 2 L of 6 M HCl? *(molar mass = 36.46 g)*

$$2 \text{ L} \times \frac{6 \text{ mol}}{1 \text{ L}} \times \frac{36.46 \text{ g}}{1 \text{ mol}} = 400 \text{ g HCl}$$

5) *How many grams of NaOH are needed to make* 1.5 L of 2 M NaOH? *(molar mass = 40.00 g)*

$$1.5 \text{ L} \times \frac{2 \text{ mol}}{1 \text{ L}} \times \frac{40.00 \text{ g}}{1 \text{ mol}} = 100 \text{ g NaOH}$$

6) How many liters of 4 M solution can be made using 100 grams of lithium bromide? (*molar mass = 86.8 g)*

$$100 \text{ g} \times \frac{1 \text{ mol}}{86.8 \text{ g}} \times \frac{1 \text{ L}}{4 \text{ mol}} = 0.29 \text{ L}$$

7) How many liters of 0.88 M solution can be made with 25.5 grams of lithium fluoride? (*molar mass = 25.94g)*

$$25.5 \text{ g} \times \frac{1 \text{ mol}}{36.46 \text{ g}} \times \frac{1 \text{ L}}{0.88 \text{ mol}} = 0.79 \text{ L}$$