CONCEPT: SOLUTIONS: MASS PERCENT

● For solutions, **mass percent** represents grams of _____ per grams of _____ multiplied by 100.

Mass Percent of Solutions

$$\text{Mass Percent} = \frac{\text{grams of}}{\text{grams of}} \times 100$$

EXAMPLE: Calculate the mass percent of a solution prepared by dissolving 34.1 g KCl in 150.0 g H_2O.

PRACTICE: Calculate the amount of water (in kilograms) that must be added to 12.0 g of urea, $(NH_2)_2CO$, in the preparation of a 18.3 percent by mass solution. The molar mass of urea, $(NH_2)_2CO$, is 60.055 g/mol.

a) 0.644 kg b) 0.0535 kg c) 6.44 kg d) 0.0775 kg

Mass Percent Conversion Factors

● When converting to other unit terms such as molarity, the mass percent value itself can represent a **conversion factor**.

□ For example, 2.50% NaOH solution represents 2.50 g NaOH within 100 g of solution.

_____

EXAMPLE: Determine the molarity of a sulfuric acid solution that is 5.0% H_2SO_4 with a density of 0.9918 g/mL.

CONCEPT: SOLUTIONS: MASS PERCENT

PRACTICE: A solution was prepared by dissolving 51.0 g of KBr in 310 mL of water. Calculate the mass percent of KBr in the solution.

a) 16.4% b) 14.1% c) 19.7% d) 0.141%

PRACTICE: An aqueous $LiNO_2$ solution is made using 90.3 g $LiNO_2$ and diluting it to a total volume of 1.72 L. If the density of the solution is 1.20 g/mL, what is the mass percent of the solution?

a) 4.37% b) 5.25% c) 4.19% d) 4.99%

PRACTICE: Determine the percent sulfuric acid by mass of a 1.37 m aqueous solution of H_2SO_4.

a) 0.1342% b) 11.85% c) 13.42% d) 13.98%