**Molarity, molality and molar fraction**

**Molarity**

I make a 2 L solution with 40 g of NaOH. What is the molarity? *(Na-23.0, O-16.0, H-1.0)*

Calculate the molarity of 25.0 grams of KBr dissolved in a 750.0 mL solution. (K-39.1, Br-79.9)

80.0 grams of glucose (C6H12O6, mm = 180 g/mol) is dissolved in enough water to make 1.00 L of solution. What is its molarity? *(C-12.0)*

Calculate the molarity when 75.0 grams of MgCl2 is dissolved in a 500.0 mL solution. *(Mg-24.3 Cl-35.5)*

100.0 grams of sucrose (C12H22O11, mm = 342.3 g/mol) is dissolved in a 1.50 L solution. What is the molarity?

49.8 grams of KI is dissolved in enough water to make 1.00 L of solution. What is the molarity? *(I-126.9)*

**Molality** (*Help: http://www.chemteam.info/Solutions/Molality.html*)

I dissolve 1 mole of sucrose into 2000 mL water. What is the molality?

Suppose you had 58.44 grams of NaCl and you dissolved it in exactly 2.00 kg of pure water (the solvent). What would be the molality of the solution?

Calculate the molality when 75.0 grams of MgCl2 is dissolved in 500.0 g of solvent.

1. 100.0 grams of sucrose (C12H22O11, mol. wt. = 342.3 g/mol) is dissolved in 3.00 L of water. What is the molality?
2. 49.8 grams of KI is dissolved in 0.50 kg of solvent. What is the molality?

**Mole fraction**

Calculate the molar fraction of each compound in the following solutions:

a) 2 g of acetic acid (mm = 60) in 15.6 g of benzene (mm = 78);

b) 11.7 g of common salt (NaCl) in 144 g of water (H2O).

**Mixture of questions:**

Determine the molarity of a sulphuric acid solution, obtained by the addition of 196 g of the acid into water until a 2 L of solution is obtained.

How many grams of potassium hydroxide will we have to weigh to obtain 250 cm3 of 2 M solution?

Determine the molality of a solution of nitric acid, if 63 g of acid are added to 500 cm3 of water.

**Dilution:**

1. Water is added to 2 L of a 0.2 M solution to a final volume of 4 L. What is the new concentration?
2. What was the original concentration of a 500 mL solution that was made up (by adding water) to a 0.5 M and 4 L solution?
3. What volume of water must be added to 25 mL of a 0.5 M solution in order to make a 0.1 M solution.
4. An NaOH solution of 1.5 L has been diluted to a volume of 3 L with a concentration of 0.6 M. What mass of NaOH was required to make the original solution?