

STUDY GUIDE : CONCENTRATION

A **solution** is a mixture formed when a solid dissolves in a liquid. The liquid that does the dissolving is called the **solvent**. The substance that is dissolved is called the **solute**. The uniformity of color in a solution suggests that a solid dissolves evenly. That is, a cubic centimeter of water in a given solution contains the same mass of material as any other cubic centimeter of water in that solution. For example, if 10 grams of a substance dissolves in 100 cm³ of water, each cubic centimeter of water contains (10 g/100 cm³) 0.1 grams of the substance.

The mass of solid dissolved per unit volume of liquid is called the "**concentration**" of the solution. The unit is the same as that of density, g /cm³. In the case of concentration, the mass refers to the dissolved solid (called the "solute") and the volume refers to the liquid (called the "solvent").

To avoid confusion, concentrations are often given in g/100 cm³. A concentration of 1.5 g/cm³ means that 1.5 g of a substance is dissolved in 1 cm³ of water. At a volume of 100 cm³ of water the solution will contain 100 x 1.5 g = 150 g of the substance. Therefore, the concentration of the solution in g/100 cm³ is 150 g/100 cm³. In general, to find the concentration of a solution in g/100 cm³, we multiply the concentration in g/cm³ by 100.

1. Based on the reading above, define each of the words below.

a. **solute** _____

b. **solvent** _____

c. **concentration** _____

2. A student dissolves 6 grams of a substance in 30 cm³ of water. What is the concentration of the solution in g/cm³?

3. A student dissolves 25 grams of a substance in 100 cm³ of water. What is the concentration of the solution in g/100 cm³ ?

4. A student dissolves 25 grams of a substance in 50 cm³ of water. What is the concentration of the solution in g/100 cm³ ? Clue: first find the concentration in g/cm³ and then multiply by 100.

5. A mass of 45.0 g of sugar is dissolved in 150 cm³ water. What is the concentration in g/100 cm³ ?
