وزارة التعليم العالي والبحث العلمي

الجامعة الإسلامية

في النجف الاشرف

Practical chemistry

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Lab-3

Preparing a Standard Solution from a Solids

And liquids

Preparing a Standard Solution from a Solid

A solution of known concentration can be prepared from solids by two similar methods. Although inherent errors exist with each of the methods, with careful technique either will suffice for making solutions in General Chemistry Laboratory. In the first method, the solid solute is weighed out on weighing paper or in a small container and then transferred directly to a volumetric flask (commonly called a "vol flask"). A funnel might be helpful when transferring the solid into the slim neck of the vol flask. A small quantity of solvent is then added to the vol flask and the contents are swirled gently until the substance is completely dissolved. More solvent is added until the meniscus of the liquid reaches the calibration mark on the neck of the vol flask (a process called “diluting to volume”). The vol flask is then capped and inverted several times until the contents are mixed and completely dissolved. The disadvantage of this method is that some of the weighed solid may adhere to the original container, weighing paper, or funnel. Also, solid may be spilled when it is transferred into the slim neckof the vol flask.

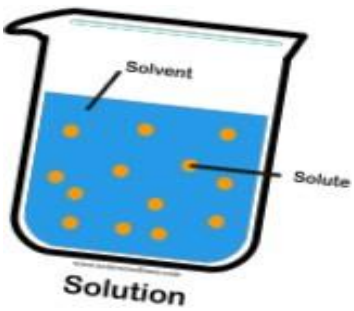
In the second method the solid is weighed out first in a small beaker. A small amount of solvent is added to the beaker and the solution is stirred until the solid isdissolved. The solution is then transferred to the vol flask. Again, a funnel may need to be inserted into the slim neck of the vol flask. Before adding additional solvent to the flask, the beaker, stirring rod, and funnel must be rinsed carefully and the washings added to the vol flask making sure all remaining traces of the Reading.

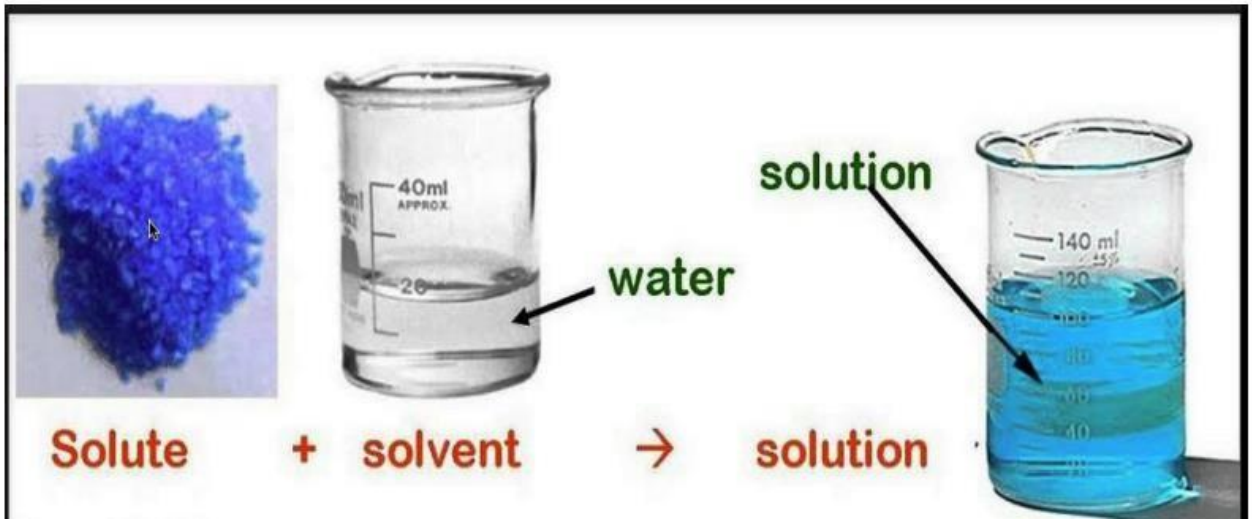
What is SOLUTIONS?

A simple solution is basically two substances that are evenly mixed together.

One of them is called the solute and the other is the solvent.

Solution can be composed from one or more solute dissolved in asolvent forming a homogenous mixture





What is **concentration?**

Refers to the amount of a substance in a defined space. Another definition is that concentration is the ratio of solute in a solution to either solvent or total solution.

There are different ways to express concentration:

1.Molarity.
2. W/V %.
3. W/W %.

Molarity

Molarity (M) indicates the number of moles of solute per liter of solution (moles/Liter) and is one of the most common units used to measure the concentration of a solution.

$$\text{Molarity} = \frac{\text{moles of solute (mole)}}{\text{volume of solution in (L)}}$$

Remember that:

Mole = weight (g) / molecular weight (g/mole)

Mole= Wt / M.W

$$\text{Molarity} = \frac{\text{weight (g)}}{\text{volume (L) x M.W}}$$

Sodium hydroxide

Sodium hydroxide (NaOH) is also known as white caustic, caustic soda or lye. It is a very strong chemical and is found in many industrial solvents and cleaners, including flooring stripping products, brick cleaners, cements, and many others. Industrially, sodium hydroxide may be used in processes to make products including plastics, soaps rayon and textiles.

Sodium hydroxide is also known as lye or soda , or caustic soda .

At room temperature, sodium hydroxide is a white crystalline odorless solid that absorbs moisture from the air. It is a synthetically manufactured substance. When dissolved in water or neutralized with acid it releases substantial amounts of heat, which may prove sufficient to ignite combustible materials.

Preparing a Standard Solution from a liquid

$$M=\frac{sp.gr*\%*1000}{M.Wt}$$

Sp.gr =specific

weightM = Molarity

% = percentage

M.Wt = Molecular weight

Dilution law

M1V1=M2V2

M1=initial molarity
V1= initial volume
M2=final molarity
V2= final volume

For example

If you dilute 300. mL of a 4.00 M solution of CH3COOH to 900 . mL , what is the new concentration of the solution? (from a step-up session)

First, you'd use your given to figure out what parts of the equation you already have and then just plugging it in.

M1= 4.00 M CH3COOH
V1= 300. mL
M2= ?
V2= 900. mL

You would end up getting 4.00 * 300. mL/900. mL = 1.33 M CH3COOH