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**First hexagram: scale/chemistry**

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***Preparing solutions***

🖎 Prepare a solution by dissolving a solid compound

🖎 Prepare a solution by diluting the starting solution (mother solution).

**A solution:** is a condensed liquid phase consisting of several components: a solvent (always larger than the solute) and one or more solutes (Si = 1, 2, 3, 4).

**Solution = solute + solvent**

There are two types of solution:

**Homogeneous solution** : consisting of one phase (components are miscible)

Heterogeneous solution: consisting of two to several phases (the components are immiscible).

**Note:** An aqueous solution is a solution in which the solvent is water

**Solvent**: A component that exists in larger quantities and in the same physical state (phase) than the solution.

**Solute:** Any substance that can be dissolved in a solvent

**Solution concentration**: It can be defined as:

**Molarity (M) (molar concentration):**

It is the number of moles of solute per liter of solution (1 mol/L); (Example: 1 molar: 1 mole of solute per 1 liter of solution); **M = Cn = n / V**

Normality (N): is the number of gram equivalents of solute per liter of solution. Gram equivalent is the amount of solute that includes one mole of the considered particles (H +,OH-)

**Systematicity = number of gram equivalents x molarity = N = z. M**

For acids, Z is the number of H+ released during the reaction

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***Example:***

**HCl → H+ + Cl –**

**H2SO4 → 2H++Cl-**

For exponents, : is the number of OH- released during the reaction

**NaOH → Na++ OH***-*

**Ba(OH)2 →Ba2+ + 2OH -**

Dissolution method: : A daughter solution is prepared with a smaller concentration than the parent solution.

***Example***

Adding a solvent (for example water) to a solution does not change the amount of solute, but it does change the concentration of the solution.

**ni = nf**

The dilution relationship (dilution ) is If :(girl solution) **Ni. Vi = Nf .Vf (stock** solution S0)

**Ci .Vi  = Cf .Vf**

From our dilution relation  **= ( +)**

Objective of the experiment :

✓ Prepare sodium hydroxide solution (NaOH)Normal 0.1N (mother solution)

✓ Preparation of hydrochloric acid solution (daughter solution) 0.01 N from the mother

solution

***Experiment tools:*** electronic balance, crucible, flask 250 ml, graduated tester, beaker 50 ml, laboratory spoon, HCL solution, solid NaOH, magnetic shaking machine, magnet, distilled water.

***How it works: Experiment 1***

✓ Calculate the mass of sodium hydroxide (NaOH) needed for the desired solution.

✓ Weigh the calculated mass without touching it with your fingers (note that this product is

highly corrosive).

✓ Close the bottle quickly to prevent sodium hydroxide hydrate and carbonate into the air.

✓ Place the calculated mass of NaOH in a 100 ml volumetric flask filled halfway with

distilled water. Shake the container until it dissolves completely Up to the top of the

measurement line (Goggi line) follow diagram 01.



***Diagram1***

***Experiment 2:***

🖎Prepare 100 ml of 0.01 N NaOH solution from the parent solution

🖎Calculate the volume of the starting solution (parent) to be withdrawn.

🖎In a Goji bottle with a capacity of 100 ml, with the help of the included Goji pipette, I withdraw the necessary volume of the mother solution and fill the bottle up to the Goji line with distilled water, close the bottle and shake until the solution is homogeneous. Follow diagram 02



***Diagram 2***

Dilution factor ) facteur de dilution ( : Dilute a solution 10 times, i.e. divide its concentration by 10, and dilute a solution 100 times, i.e. divide its concentration by 100. The dilution factor represents F and can be calculated by the relationship :

Important note To calculate the molar concentration (initial concentration) of a commercial liquid solution, we follow the following: Example: According to the information shown on the label of the bottle of hydrochloric acid (HCl), the molar concentration of this acid is:

|  |
| --- |
| HCl  M =36.46  (p/p)%= 37%  d=1.15 |

|  |
| --- |
| M = Ci = = = 11.67 ( mol/l) |