



**University Kasdi Merbah Ouargla**  
**Faculty of Mathematics & Matter Sciences**  
**Department of Chemistry**



**Year:** 2023\2024 **Course:** Chemistry 1 **Level:** First year

**TD N1: Generalities**

**Exercise N 1:**

How many moles of atoms and molecules are there in 2g of dihydrogen ( $H_2$ ) at room temperature?

**Exercise N2:**

1g of NaCl is completely dissolved in 90 ml of water whose density is 0.998 g/ml. An aqueous solution of sodium chloride of 90 ml is obtained.

- 1-What is the NaCl mass percentage of this solution.
- 2- What is the molar fraction of NaCl of this solution.
- 3-What is the molality of NaCl.
- 4-What is the molar concentration of NaCl

$M_{Na} : 23\text{g/mole}$  ;  $M_{Cl} : 35.5\text{g/mole}$

**Exercise N 3:**

A sample of copper oxide CuO has a mass  $m = 1.59$  g.

How many moles and molecules of CuO and atoms of Cu and O are there in this sample?

$M_{Cu} = 63,54 \text{ g.mol}^{-1}$  ;  $M_O = 16 \text{ g.mol}^{-1}$

**Exercise N 4:**

A sample of methane  $CH_4$  has a mass  $m = 0.32$  g.

How many moles and molecules of  $CH_4$  and atoms of C and H in this sample?

$M_C = 12\text{g.mol}^{-1}$

**Exercise N 5:**

Which of the following samples contains the most iron? 0.2 moles of  $Fe_2(SO_4)_3$  , 20g iron,

0.3 gram atom of iron,  $2.5 \times 10^{23}$  iron atoms.

Notes:  $M_{Fe} = 56 \text{ g.mol}^{-1}$  ,  $M_S = 32\text{g.mol}^{-1}$

Number of Avogadro:  $N_A = 6,023. 10^{23}$