

University of M'sila			2 St year CT-NLS
Faculty of Sciences/ CT-NLS			Duration: 15 min
Interrogation of biophysics 2023/2024			
Nom:	First name:	Gr:	Note:

Interrogation of Chapter I

Exercise 01

1. Write the relation between the molar and ponderal concentration.
2. Write the relation the osmolar, ionic, and equivalents Concentrations.

Exercise 02

one liter of an aqueous solution Contains 60g of sucrose, 1.8g of urea, 17.6g of NaCl

1. Calculate the osmolarity concentration of a solution.

$M_{\text{sucrose}} = 342$, $M_{\text{Urea}} = 60$, $M_{\text{NaCl}} = 58.5 \text{ g/mol}$

Correction of interrogation of Chapter I

Exercise 01

1. Mass concentration can be calculated using molar concentration, by replacing $m = n \times M$ in the mass concentration relation. So, the relation becomes as follows: $C_p = C \times M$
2. Osmolar and Ionic Concentration and equivalents.

Osmolar Concentration

$$W = i \times C$$

- it is expressed in **Osm/m³** or **mOsm/L**

Ionic Concentration

$$C_i = C_i^+ + C_i^- = (n^+ \alpha C) + (n^- \alpha C)$$

- it is expressed in **g ions/m³** or **grams ions/L**.

Equivalents Concentration

$$C_{eq} = C_{eq}^+ + C_{eq}^- = z^+ C_i^+ + z^- C_i^- = z^+ (n^+ \alpha C) + z^- (n^- \alpha C)$$

- it is expressed in **equivalent /m³** or **equivalent /L**. **equivalent /m³** or **equivalent /L**.

Exercise 02

Calculate the osmolarity concentration of a solution.

1. calculate the matter quantity: $n=m/M$

$$n_{\text{sucrose}} = 0.175 \text{ mol}$$

$$n_{\text{urea}} = 0.03 \text{ mol}$$

$$n_{\text{NaCl}} = 0.3 \text{ mol}$$

2. calculate the molar concentration: $C=n/V$

$$C_{\text{sucrose}} = 0.175 \text{ mol/L}$$

$$C_{\text{urea}} = 0.03 \text{ mol/L}$$

$$C_{\text{NaCl}} = 0.3 \text{ mol/L}$$

3. calculate the osmolarity concentration: $W=i.C$

$$W_{\text{sucrose}} = 0.175 \text{ osmol/L}$$

$$W_{\text{urea}} = 0.3 \text{ osmol/L}$$

$$W_{\text{NaCl}} = 0.03 \text{ osmol/L}$$

4. the osmolarity concentration of a solution: $W_{\text{solution}} = 0.805 \text{ osmol/L}$.