CONCEPT: EQUIVALENTS

● *Equivalents* are used to measure individual _____ amount present in body fluids and intravenous solutions.

□ **Equivalent (Eq):** number of moles of _____ that one ion contributes to a solution.

- Eq equals to 1 mol of positive or negative _____ -Eq can only be a _____ value

1 mol Na^{+} = 1 Eq Na^{+}	**1 mol Fe^{+3} = 3 Eq Fe^{+3}**

●To calculate number of equivalents of an ion, we simply multiply ion charge by number of _____ of ion present.

□ *mEq* is a common unit used to express equivalents: **1 Eq = 1000 mEq**.

Equivalent (Eq)

Eq = ion charge x moles of ion

EXAMPLE: Calculate number of Equivalents in each of the following:

a) 1 mole of Ca^{2+} b) 2 moles of PO_4^{3-}

Normality

● Concentration of ions in aqueous solutions is represented by *Normality.*

□ **Normality (N):** represents number of _____ per L of solution.

Normality (N)

$$\textbf{Normality} = \frac{\text{Equivalent}}{\text{L solution}}$$

EXAMPLE: Calculate the Normality of 0.35 mole of Mg^{2+} ions present in a 300 mL of blood.

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PRACTICE: Calculate mass (grams) needed for the following ion equivalent: 1.5 mEq of Na^+ ions.

a. 3.4 g b. 15.0 g c. 0.065 g d. 0.034 g

PRACTICE: The concentration of Cl^- ion in blood is approximately 105 mEq/L. How many milliliters of blood would be needed to obtain 1.4 g of Cl^- ions?

a. 110 mL b. 380 mL c. 75 mL d. 240 mL

PRACTICE: An intravenous saline solution contains 140 mEq/L of Na^+. How many mEq of Na^+ are present in 750 mL of the solution?

a. 525 mEq b. 5.36 mEq c. 105 mEq d. 187 mEq

PRACTICE: Calculate the normality (mEq/L) of potassium ions in a 500 mL Ringer's solution that is 2.0×10^{-3} M in potassium ions.

a. 2.0 mEq/L b. 0.200 mEq/L c. 2.5 mEq/L d. 0.250 mEq/L