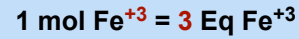
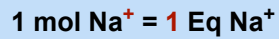


CONCEPT: EQUIVALENTS

- *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



- 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)

$$\text{Eq} = \text{ion charge} \times \text{moles of ion}$$

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)

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

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

CONCEPT: EQUIVALENTS

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