Series N°3

Exercise N° 1:

I)Complete and balance the following equation:

MnO_4^-	+	Fe^{2+}	⇔	Mn^{2+}	+	Fe^{3+}	(Acidic medium, basic medium)
ClO_3^-	+	Fe^{2+}	⇔	Cl^-	+	Fe^{3+}	(acidic medium).
ClO_3^-	+	CrO_2^-	⇔	Cl^-	+	CrO_4^{2-}	(Basic medium).
$Cr_2O_7^{2-}$	+	Fe^{2+}	⇔	Cr^{3+}	+	Fe^{3+}	(Acidic medium).
I_2	+	H_2S	⇔	I^-	+	S	(acidic medium).
IO_3^-	+	$Cr(OH)_3$	⇔	CrO_4^{2-}	+	I^-	(Basic medium).
Al	+	NO_3^-	⇔	$Al(OH)_4^-$	+	NH_3	(Basic medium).

II) Considering the previous results

1) Calculate the molarity of a normal solution of KIO_3?

2) Calculate the normality of a Deci molar solution of K_2CrO_7?

3) What mass must be dissolved in 350 ml of water to obtain a solution of H_2S at 0.08 eqg/l?

Exercise N° 2:

I) We have four aqueous solutions of HCl, FeSO4, $MgCl_2$ and $AgNO_3$ and three blades of iron, magnesium and silver.

- What happens if we immerse the slides in each of the solutions?

Data: $E°Fe^{2+}/Fe$ = - 0,44 V $E°Mg^{2+}/Mg$ = - 2,37V $E°Ag^{+}/Ag$ =+0,80 V

Exercise N° 3:

You make a voltaic cell with chromium metal in 0.1 M $Cr(NO_3)_3$ solution as one half-cell ($E^o_{Cr/Cr3+}$ = -0.74 V) and silver metal in 0.1 M $Ag(NO_3)$ solution at the other half-cell ($E^o_{Ag+/Ag}$ = + 0.80V).

1- Draw the voltaic cell represented by this reaction and label the cathode, the anode, the salt bridge, the positive electrode, and the negative electrode.
2- Construct the Cell Diagram (A simplified representation of the cell).
3- Write the half-reaction that describes the chemistry at the anode.
4- Write the half-reaction that describes the chemistry at the cathode.
5- Write the overall reaction.
6- Using the above concentration cell, determine the **emf**.
7- What is the equilibrium constant for the system and for what concentration of Ag^+ and Cr^{3+} will the EMF of the cell be zero. Conclude.

Doctor: Bougueria Hassiba.