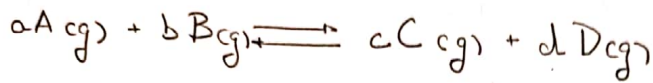


EQ QCO



$$K_p = \frac{P_c^c \cdot P_d^d}{P_b^b \cdot P_a^a} \quad (\text{GASES})$$

• Si EQ1 \rightarrow K_{p1} DATO
 EQ2 \rightarrow K_{p2} ?

Si $\left[\begin{array}{l} EQ_2 = EQ_1 \cdot N \\ EQ_2 = \frac{EQ_1}{N} \end{array} \right. \quad \left[\begin{array}{l} K_{p2} = (K_{p1})^N \\ K_{p2} = \sqrt[N]{K_{p1}} \end{array} \right]$

$$K_c = \frac{[C]^c \cdot [D]^d}{[A]^a \cdot [B]^b}$$

$$K_p = K_c \cdot (RT)^{\Delta n}$$

$$\Delta n = (c+d) - (a+b)$$

• Si EQ1 \rightarrow K_{p1} } DATO
 EQ2 \rightarrow K_{p2} }
 EQ3 \rightarrow K_{p3} ?

Si $\left[\begin{array}{l} EQ_3 = EQ_1 + EQ_2 \\ EQ_3 = EQ_1 - EQ_2 \end{array} \right. \quad \left[\begin{array}{l} K_{p3} = K_{p1} \cdot K_{p2} \\ K_{p3} = \frac{K_{p1}}{K_{p2}} \end{array} \right]$

(α) grado de disociación

Si DISOCIA \rightarrow Lo que REACCIONA

$$\alpha = \frac{n_{reac.}}{n_{inicial}} = \frac{X}{\dots}$$

Dirección de reacción

\rightarrow ESTUDIO PREVIO:

$$\left[\begin{array}{l} Q_p > K_p \quad \leftarrow \\ Q_p < K_p \quad \rightarrow \\ Q_p = K_p \quad \text{EQ.} \end{array} \right]$$

$$Q_p = \frac{P_c^c \cdot P_d^d}{P_a^a \cdot P_b^b}$$

Le CHATELIER

VOLVER AL EQUILIBRIO
 Y OPONERSE AL CAMBIO

$$PV = nRT$$

$$P_i = \gamma_i \cdot P_{tot}$$

$\Delta H > 0$ ENDOTERMICO

$\Delta H < 0$ EXOTERMICO

Factores que afectan al equilibrio

- Cambio de $[C]$ o P : $(= \rightarrow -)$ $(- \leftarrow =)$

- Cambio de P_{tot} : $P_{tot} \uparrow$ favorece al sentido donde se creen \ominus moles gases

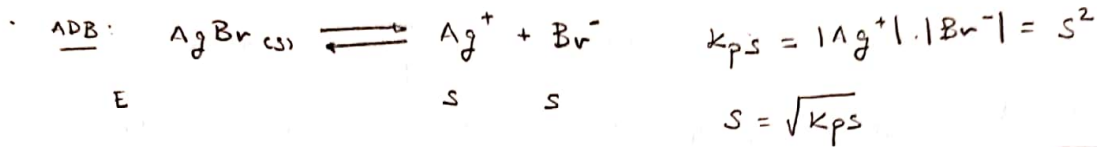
- Cambio de V : $PV = nRT \rightarrow P = \frac{nRT}{V}$ (EL CONTRARIO DE P)

- cambio de T : exotermicas $T \downarrow$ $K_p \uparrow$ (\rightarrow)

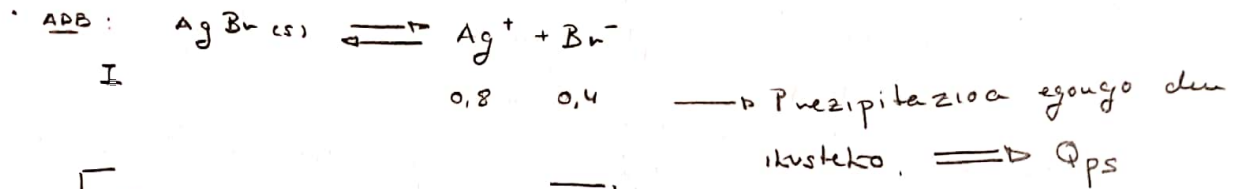
endotermicas $T \uparrow$ $K_p \uparrow$ (\rightarrow)

- inertes: No afectan al eq. (P_{KTC} hace desplazar hacia \oplus gas)

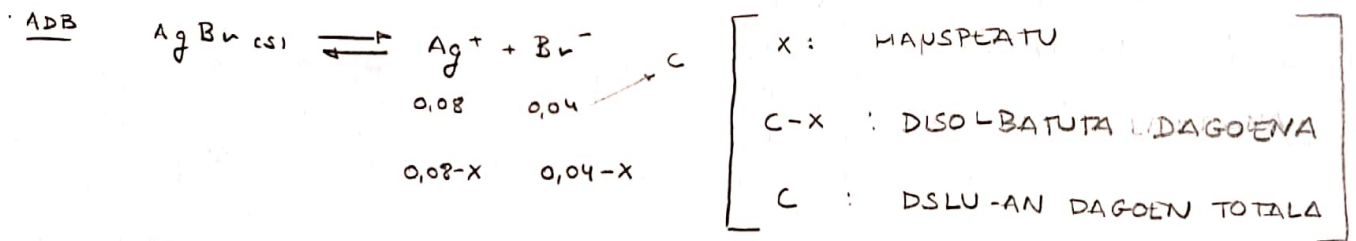
SOLUBILIDAD



$[S: \text{DISOLBATZEN DENAREN KONZENTRAZIOA. (mol/l)}]$



$Q_{ps} > K_{ps}$	PREZIPITATU
$Q_{ps} < K_{ps}$	EZ PREZIPITATU
$Q_{ps} = K_{ps}$	OREKA



$[S \text{ TXIKIENA}] \rightarrow \text{1. PREZIPITAZEN} \Rightarrow S\text{-a GAZAREN } K_{ps}\text{-AREN MENPE}$

$[[\text{ION}^+]] \text{ EA ESTEQ. BERDINAK} \rightarrow \text{1. PRZPT} \Rightarrow K_{ps} \text{ TXIKIENA}$

$[[\text{OH}^-] = [\text{H}^+] = 10^{-7}] \text{ KONTUZ!}$

- $\text{pH} \uparrow$ disolbagaitasuna \downarrow $[\text{OH}^-] \uparrow$ BASIKOAGO
- $\text{pH} \downarrow$ disolbagaitasuna \uparrow $[\text{OH}^-] \downarrow$ AZIDOAGO

ERREDOX

ERREDUKZIOA: e^- -ak IRABAZI // OXIDAZIO ZENB. JAITSI

OXIDAZIOA: e^- -ak GALDU // OXIDAZIO ZENB. IGO

OXIDAZIO ZENBAKIA: OXIGENO [-2] HIDROGENO [+1] BAKUNAK [0]
 (peroxido -1) (hidruro -1)
 $\begin{matrix} +1 & -1 \\ H_2 & O_2 \end{matrix}$ $\begin{matrix} +1 & -1 \\ Na & H \end{matrix}$ $\begin{matrix} 0 & 0 \\ O_2, & Cl_2 \end{matrix}$

• 201 - ELEKTROI METODOA: 1.- MASA 2.- KARGA
 OXIGENO $\longrightarrow + H_2O$ $\longrightarrow e^-$
 HIDROGENO $\longrightarrow + H^+$

ENERGIA QCA \longrightarrow ELEKTRIKA? R. REDOX ESPONTANEOA

$E_{pila} > 0$	\longrightarrow R. ESPONTANEOA	$\Delta G < 0$	$\Delta G = -nFE$
$E_{pila} < 0$	\longrightarrow R. <u>EZ</u> ESPONTAN.	$\Delta G > 0$	n : nº moles e^-
$E_{pila} = 0$	\longrightarrow EQ. QCO	$\Delta G = 0$	F : 96500 C/mol e^-

• E° BALDINTZA NORMALETAN \longrightarrow 298K (25°C), [C] = 1M $P_g = 1 \text{ atm}$

• MEJOR agente REDUCTOR: E MENOR // HACE reducir, SE oxida.

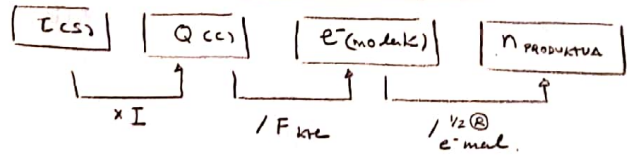
• MEJOR agente OXIDANTE: E MAYOR // HACE oxidar, SE reduce.

• NOTACION: ANODO (-) // KATODO (+) [PILAS]

• NERST:
$$E = E^\circ - \frac{0,0257}{n} \ln Q$$

• FARADAY:
$$I = \frac{Q}{t}$$

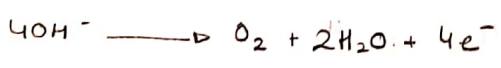
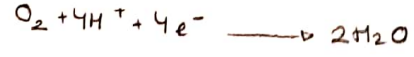
$$0 = E^\circ - \frac{0,0257}{n} \ln K$$



• PILAS DE CONCENTRACION
 REDUCE \longrightarrow [] \uparrow

$E = \eta \cdot V$

• NOTACION: ANODO (+) // KATODO (-) [ELEKTROLISIS]



[ANODO]

[KATODO]

FASEEN ARTERO OREKA

- LIKIDO - GAS :

- $T \uparrow \rightarrow$ SOLUB. \downarrow [EXO TERMIKO]
- $P \uparrow \rightarrow$ SOLUB. \uparrow

HENRY

$$C_{\text{gas}} = K_h \cdot P_{\text{gas}} \quad (K_h = \text{mol/Latm})$$

$$X_{\text{gas}} = K_h P_{\text{gas}} \quad (K_h = \frac{1}{\text{atm}})$$

$$P_{\text{gas}} = K_h \cdot X_{\text{gas}} \quad (K_h = \text{atm})$$

- SOLIDO - LIKIDO :

T^o congelación

$$\Delta T_c = K_c \cdot m \cdot i$$

$$\Delta T_c = T^{\circ} - T$$

T^o ebullición

$$\Delta T_e = K_e \cdot m \cdot i$$

$$\Delta T_e = T - T^{\circ}$$

Presion de vapor

$$P = X_d \cdot P_d^{\circ}$$

$$\Delta P = X_s \cdot P_d^{\circ} \cdot i$$

$$\Delta P = P_d^{\circ} - P$$

Presio osmotikoa

$$\pi = MRT \cdot i$$

$$[\text{ISOTONIKOA: } \pi_1 = \pi_2]$$

VANT HOFF (i)

STO DISOCIA $\rightarrow i \neq 1$

STO NO DISOCIA $\rightarrow i = 1$

$$i = \frac{n \text{ partikulas finales presentes}}{n_{\text{micial}}}$$

- LIKIDO - LIKIDO :

$$\begin{cases} P_A = X_A \cdot P_A^{\circ} \\ P_B = X_B \cdot P_B^{\circ} \\ P = X_A P_A^{\circ} + X_B P_B^{\circ} \\ P_A = Y_A \cdot P \\ P_B = Y_B \cdot P \end{cases}$$

MAS VOLATIL $P_A^{\circ} > P_B^{\circ}$

$$[X_A + X_B = 1]$$

Antoine

$$\ln P = A - \frac{B}{T + C}$$