

Clase 1 5 Marzo 2021

Título de la nota

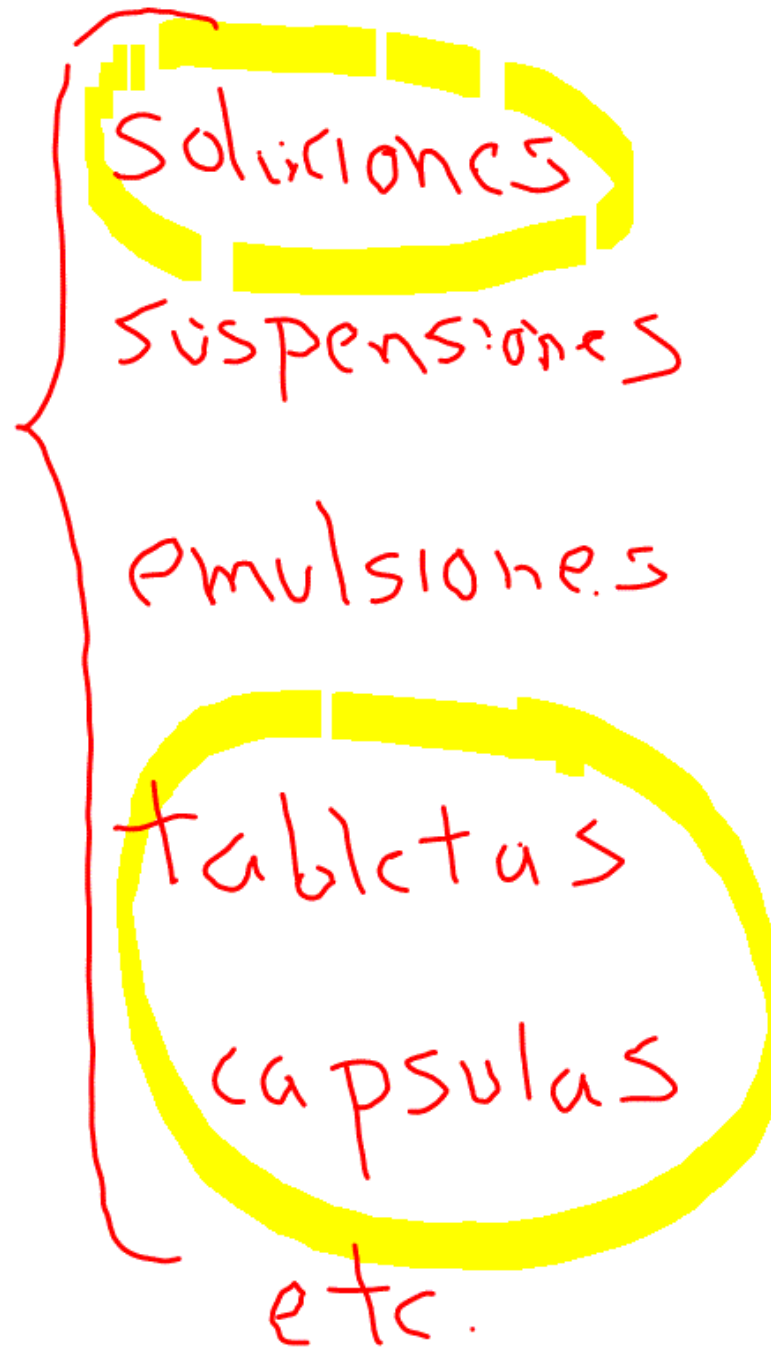
05/03/2021

Sustancias
de
Interés
Farmacéutico

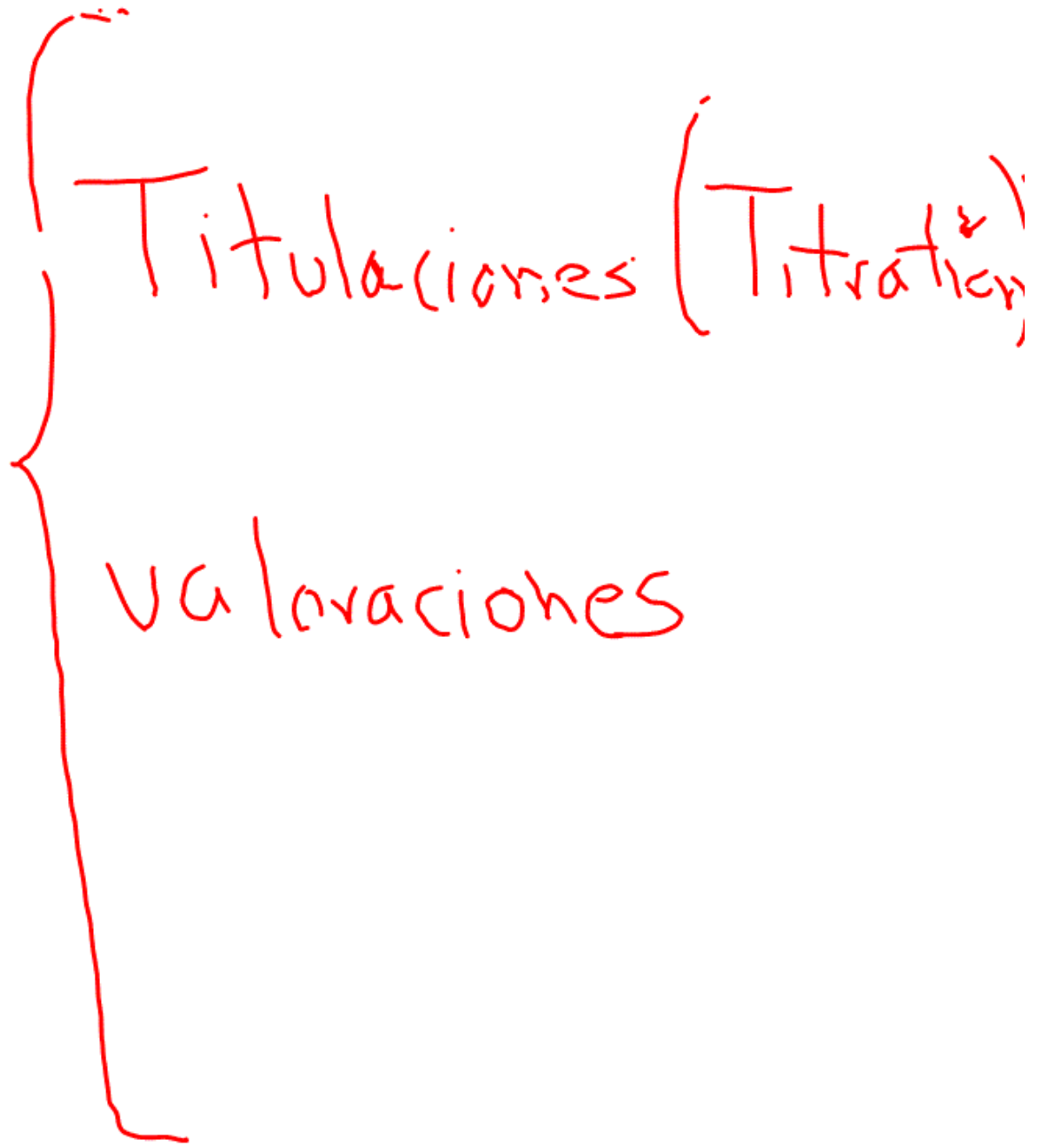
p. activos

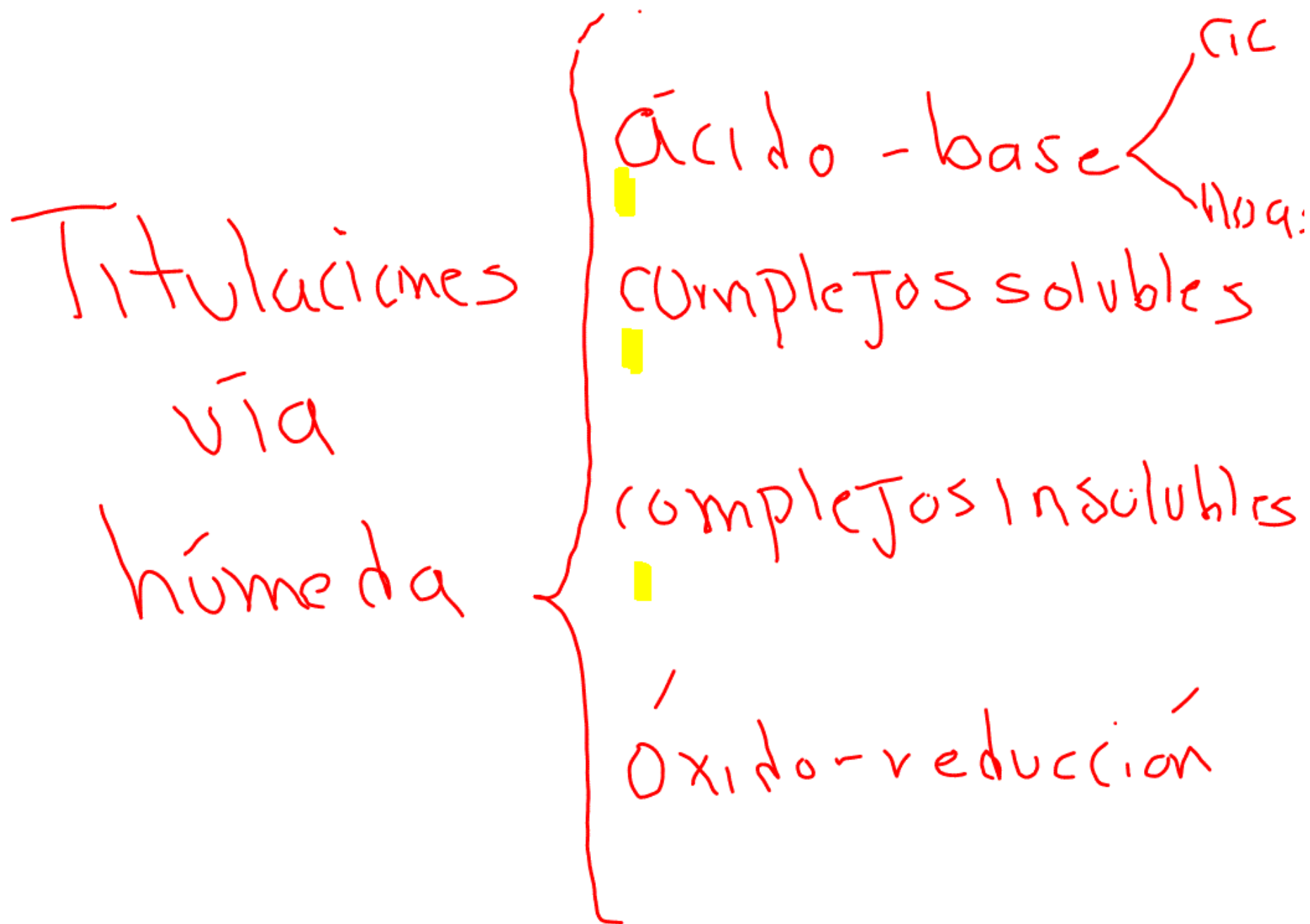
excipientes

Forma
Farmaceutica



Vía
húmeda





equilibrio químico

Reacciones

completas

Incompletas

Reacciones
Incompletas
o
en
equilibrio

Cuantitativas

C.V. $\leq 1.5\%$.

% Q $> 99\%$.

No Cuantitativas

% Q $< 99\%$.

$$C.V. \approx \frac{5}{x} \times 100 \leq 1.5\%$$

Vía húmeda

1 verdadera
~~0.05M~~ 0.1M ~~0.15M~~

$$\bar{X} = 0.1M$$

$$\bar{X} \pm 0.05$$

$$0.1 \pm 0.05$$

prueba Q de valores anómalos

✓ rechazo o aceptación
de valores o resultados

Keq { Reacciones incompletas
Reacciones { T, P, []
I, pH
Reacciones secundarias



$$K_{eq} = \frac{a^c a^d}{a^A a^B}$$

$a =$ conc. efectiva

$$a = \gamma \begin{bmatrix} & \\ & \end{bmatrix}$$

$$\gamma = 1 \quad \text{sist ideal.}$$

$$\gamma > 1$$

real.

$$\gamma < 1$$

\mathcal{R} divididas

Soluciones

Dispersiones
homogéneas

$\mathcal{R} \rightarrow 1$ ideal.

Titulantes $\left\{ \begin{array}{l} 10^{-2} \text{ M} \\ \gamma \rightarrow 1 \\ \text{ideal.} \end{array} \right.$

$$K_{eq} = \frac{\gamma_c []_c \gamma_D []_D}{\gamma_A []_A \gamma_B []_B}$$

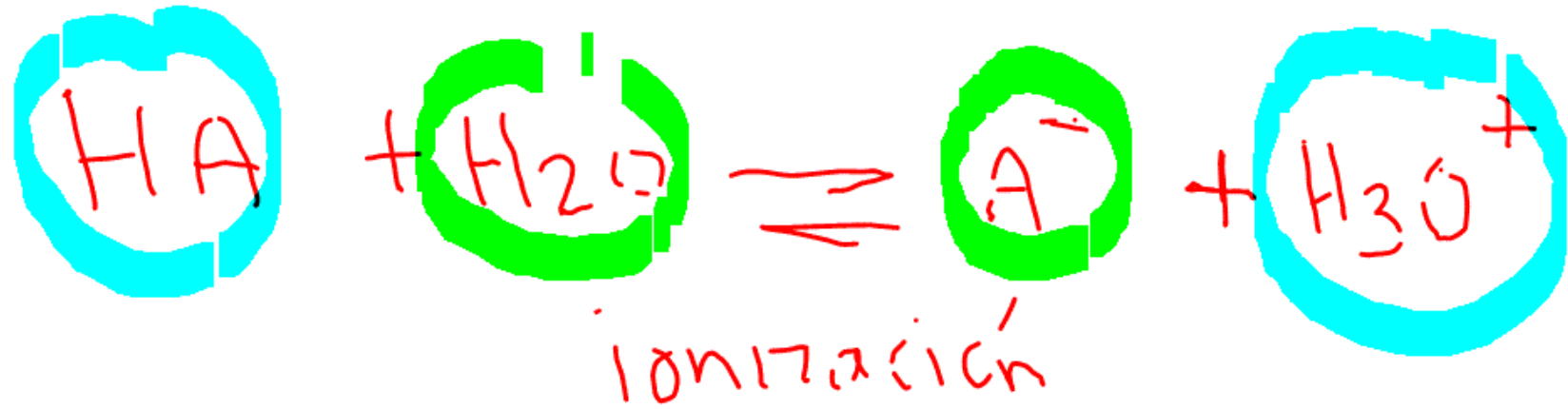
$$K_{eq} = \frac{[C][D]}{[A][B]}$$



$$K_{eq} = K_a = \frac{[A^-][H_3O^+]}{[HA][H_2O]} \rightarrow !$$

$$K_a = \frac{[A^-][H_3O^+]}{[HA]}$$

electrolitos {
Ftes $\alpha > 90\%$
Fza media $10\% < \alpha < 90\%$
débiles $\alpha < 10\%$



ácido-base

H₂O
Disolvente anfotérico

{	Base
	ácido



$$C_0(1-\alpha)$$

$$C_0 - \alpha C_0$$

$$\alpha C_0 \quad \alpha C_0$$

$$K_a = \frac{\alpha C_0 \quad \alpha C_0}{C_0(1-\alpha)}$$

$$\frac{K_a}{C_0} = \frac{\alpha^2}{1-\alpha}$$

Dilución de Ostwald

$$\frac{K_a}{C_0} < 10^{-1} \quad \text{Débil}$$

$$\frac{K_a}{C_0} > 10^1 \quad \text{Fte}$$

Fza media

$$\frac{K_a}{C_0} \cdot 10^{-1} < \frac{K_a}{C_0} < 10^1$$

Agua (pH)

$$\text{pH} = -\log a_{\text{H}_3\text{O}^+}$$

$$\text{pH} = -\log \gamma_{\text{H}_3\text{O}^+} [\text{H}_3\text{O}^+]$$

$$\gamma_{\text{H}_3\text{O}^+} \rightarrow 1$$

$$\text{pH} = -\log [\text{H}_3\text{O}^+]$$

$$pH = -\log [H^+]^2$$

$$= -2$$

$$[H^+] = 10^1$$

$$[H^+] = 10^0 = 1M$$

$$pH = -\log y / 10^0$$

$$\approx 0$$

potenciometro $\neq 0$

electrodo



→ Soln ref

0.1 M
H₃C⁺

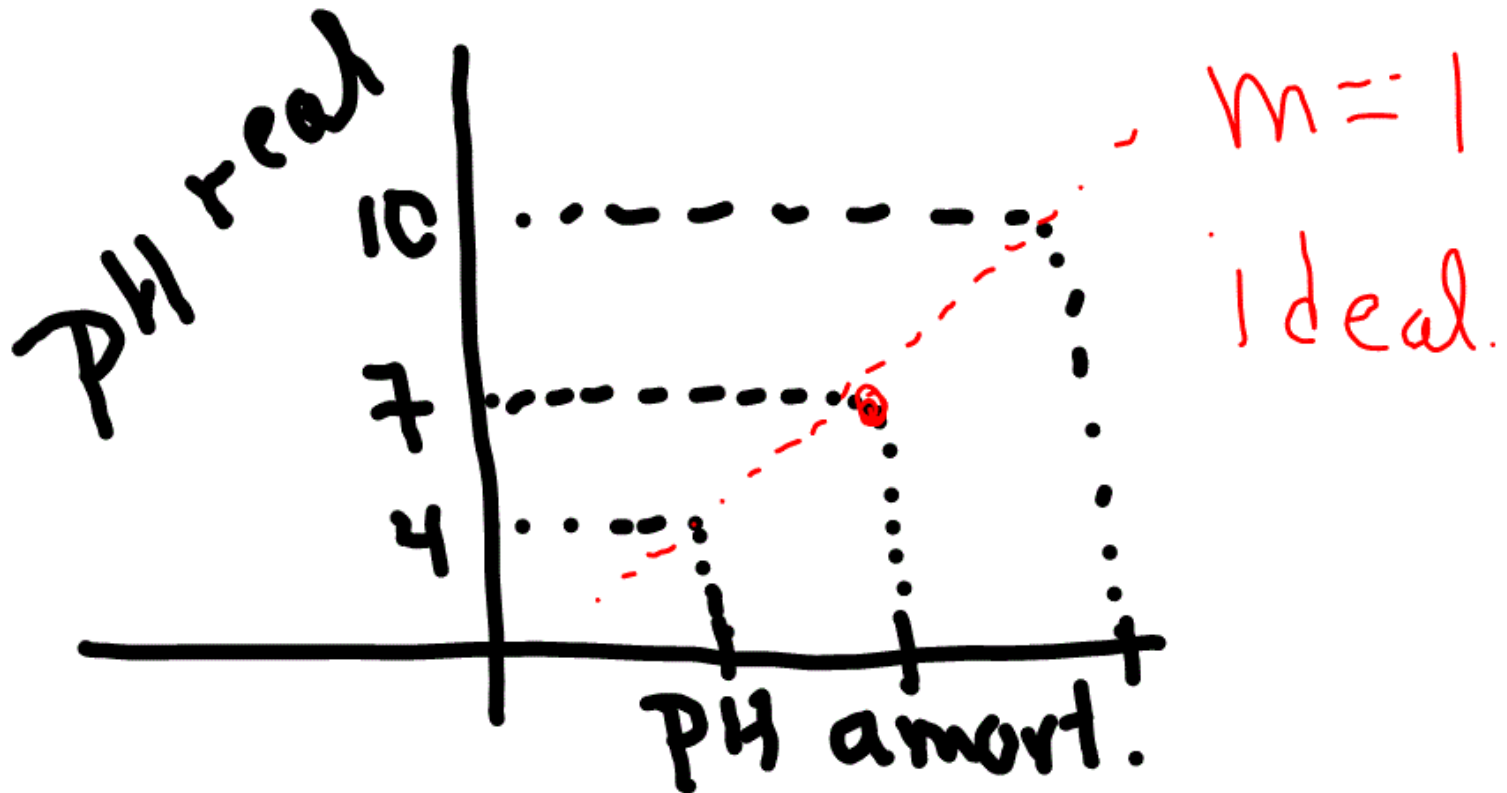
10^{-1} M

$$\text{pH} = -\log 10^{-1}$$
$$= 1$$

Calibración potenciómetro

Sln. Amortiguadores

$\text{pH} = 4, 7, 10$



$m \geq 0.95$ electido
es adecuado

$m < 0.95$ reactivarlo

$$k_a k_b = K_w$$
$$= 10^{-14}$$

$$T = 25^\circ\text{C}$$

Vant Hoff

$$\ln \frac{v_2}{k_1} = \frac{\overline{\Delta H_R}}{R} \left[\frac{1}{T_1} - \frac{1}{T_2} \right]$$
$$T_1 = 298.15 \text{ K}$$

$$pK_a = 4.5 \quad 10^{-2} M$$



$$K_a = 10^{-4.5}$$

$$\frac{K_a}{C_0} = \frac{10^{-4.5}}{10^{-2}} = 10^{-2.5} \text{ débil}$$



$$K_{eq} = \frac{[A^-] [\cancel{H_2O}]}{[HA] [OH^-]}$$

$$K_{eq} = \frac{[A^-][H_3O^+]}{[HA][OH^-][H_3O^+]}$$

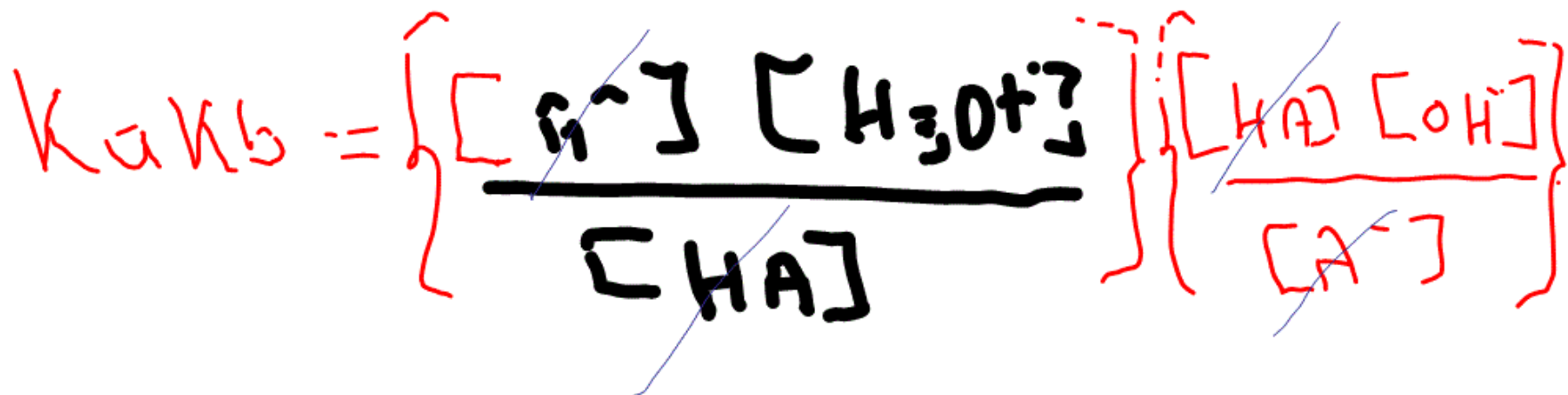
$$K_{eq} = K_r = \frac{K_a}{K_w} = \frac{10^{-4.5}}{10^{-14}}$$

$$K_r = 10^{9.5}$$



$$K_b = \frac{[HA][OH^{-}]}{[A^{-}][H_2O]}$$

$$K_a = \frac{[A^{-}][H_3O^{+}]}{[HA]}$$



$$\left\{ K_a K_b = K_w \right\} - \log$$

$$-\log a = p_a$$

$$-\log K_a = pK_a$$

$$K_a = 10^{-4.5} \quad pK_a = -\log_{10} 10^{-4.5} = 4.5$$

$$pK_a + pK_b = pK_w$$

$$4.5 + pK_b = 14$$

$$pK_b = 14 - 4.5$$

$$pK_b = 9.5$$



$$K_{eq} = \frac{[\text{H}_3\text{O}^+][\text{OH}^-]}{[\text{H}_2\text{O}]^2}$$

$$K_{eq} = K_w$$



$$\text{pH} + \text{pOH} = \text{p}K_w$$

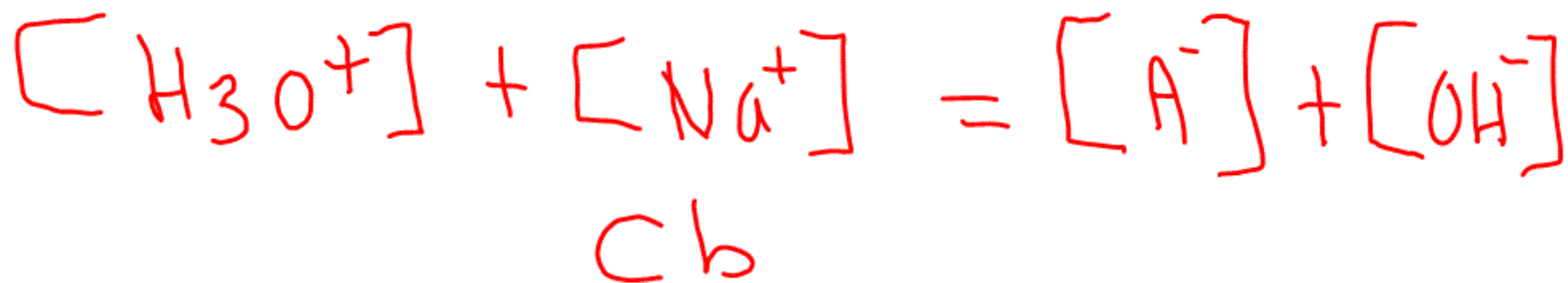
$$\text{pH} + \text{pOH} = 14$$

$$\text{pH} = 14 - \text{pOH}$$

$$pH = 14 + \log [OH^-]$$

 Na^+


electroneutralidad



$$[Na^+] = cb$$

$$cb = [OH^-] + [A^-] - [H_3O^+]$$

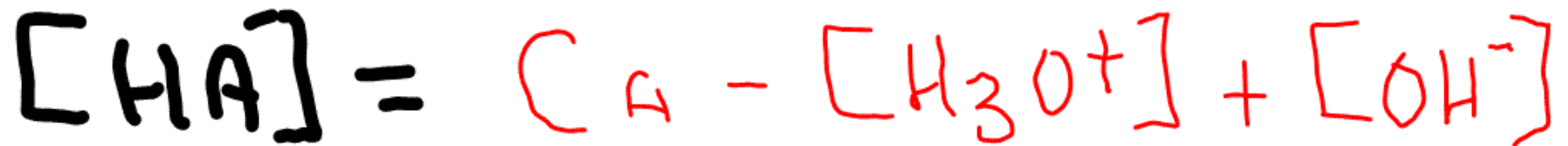
$$[A^-] = cb + [H_3O^+] - [OH^-]$$

$$K_a = \frac{[A^-][H_3O^+]}{[HA]}$$

$$K_a = \frac{[A^-][H_3O^+]}{[HA]}$$

$$K_a [HA] = [A^-][H_3O^+]$$

$$[H_3O^+] = \frac{K_a [HA]}{[A^-]}$$



$$[H_3O^+] = K_a \frac{[HA]}{[A^-]}$$

$$[H_3O^+] = K_a \frac{C_A - [H_3O^+] + [OH^-]}{C_B + [H_3O^+] - [OH^-]}$$

electrolito fuerte

Ácido fuerte

$$\left\{ [H_3O^+] = CA \right\} - \log$$



$$pH = -\log CA$$

electrolito débil
ácido débil

$$[H_3O^+] = K_a \left\{ \frac{CA}{[H_3O^+]} \right\}$$

$$\left\{ [H_3O^+]^2 = K_a CA \right\} - \log$$

$$pH = \frac{pK_a - \log CA}{2}$$

$$pH = \frac{1}{2} pK_a - \frac{1}{2} \log C_A$$