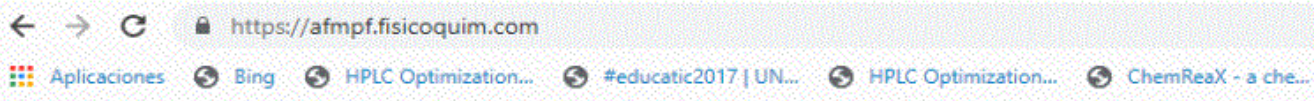


Clase 46 S Mayo 2022

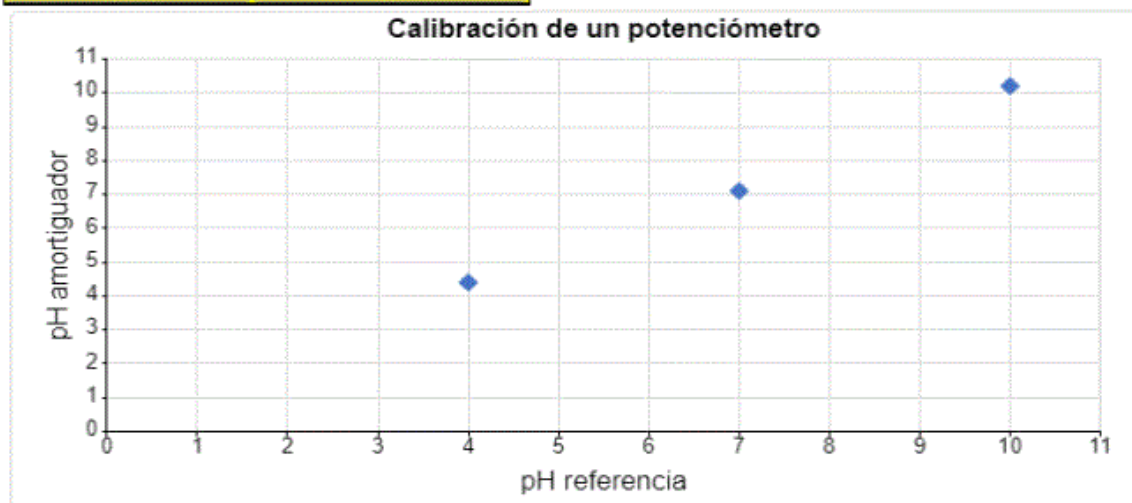
Título de la nota

05/05/2022



Introducir en las celdas de color amarillo los valores correspondientes

pH amortiguador	pH referencia	Pendiente	0.9667
7.10	7.00	Conclusión	BUEN ELECTRODO
4.40	4.00		
10.20	10.00		



Dr. Juan Carlos Vázquez Lira 2021

Con apoyo del programa DGAPA-UNAM-PAPIME PE-202021

Reseteo

Imprimir

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

$$a_{\text{H}_3\text{O}^+} = \gamma_{\text{H}_3\text{O}^+} [\text{H}_3\text{O}^+]$$

$\gamma \rightarrow 1$ ideal. $[\]$ bajas

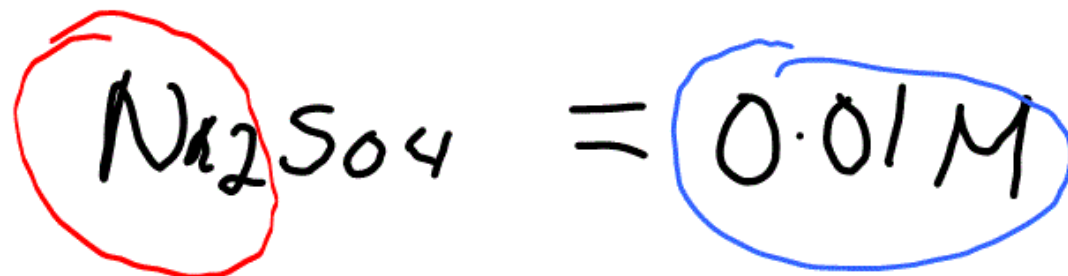
$$pH = -\log [H_3O^+]$$

Actividad = $f([])$, iones

$$I = \frac{1}{2} \sum_{i=1}^n [i] (z^+)^2$$

Fza
iónica

$$\begin{aligned} \text{NaCl} &= [0.01\text{M}] \\ I &= \frac{[\text{Na}^+] i^2 + [\text{Cl}^-] (-1)^2}{2} \\ &= \frac{(0.01\text{M})(1) + 0.01\text{M}(1)}{2} \\ &= 0.01\text{M} \end{aligned}$$



$$I = [\text{Na}^+] (1)^2 + [\text{SO}_4^{2-}] (-2)^2$$

$$= [2 \times 0.01] (1) + [0.01] (4)$$

$$= \frac{0.02 + 0.04}{2}$$

$$= 0.03 \text{ M}$$



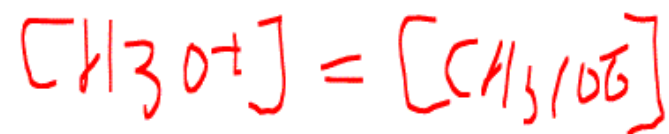
K_a



25°C

potenciometro

Titulación



$$-\log(K_a) = pK_a$$



$$K_w = 1 \times 10^{-14} \quad 25^\circ C$$

$$pK_w = 14$$

$$\begin{aligned} (K_w) - \log &= (1 \times 10^{-14}) - \log \\ &= 14 \end{aligned}$$

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

$$[H_3O^+]^2 = 1 \times 10^{-14}$$

$$[H_3O^+] = \sqrt{1 \times 10^{-14}}$$

$$[H_3O^+] = 10^{-14/2}$$

$$[H_3O^+] = 10^{-7} \quad] - \log$$

$$\boxed{pH = 7}$$

✓



Efecto de la Temperatura en la Ka

Instrucción: Insertar en las celdas de color amarillo los valores correspondientes, desplazar para cambiar temperatura.

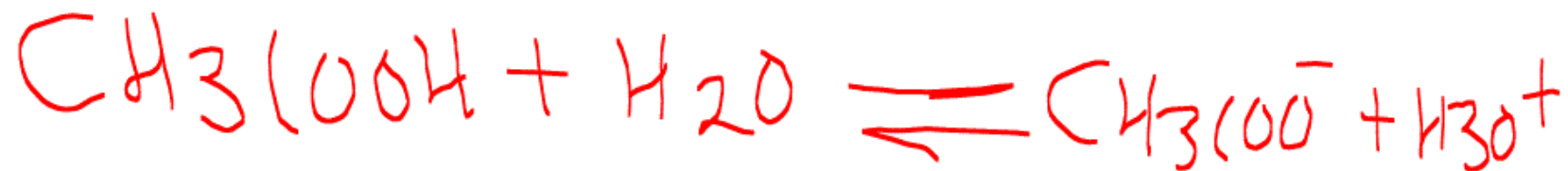
REACCIÓN

	1	CH ₃ COOH	+	H ₂ O	↔	1	H ₃ O ⁺	+	1	CH ₃ COO ⁻
Estado		líquido		líquido		acuoso			acuoso	

Especie	Cp (J/molK)						
	ΔH _F (kJ/mol)	ΔG _F (kJ/mol)	S _F (J/molK)	a (J/molK)	bT (J/molK ²)	cT ² (J/molK ³)	R (J/molK)
H ₃ O ⁺	-285.50	-237.13	69.90	75.40	0.00	0.00	8.314
CH ₃ COOH	-485.60	-376.95	-10.70	112.97	0.00	0.00	(kJ/molK)
H ₂ O	-285.50	-237.13	69.90	75.40	0.00	0.00	0.008314
CH ₃ COO ⁻	-485.20	-404.07	205.43	124.30	0.00	0.00	

ΔCp (J/molK)			ΔH ^o _R (kJ)	ΔG ^o _R (kJ)	ΔS ^o _R (kJ/K)	ΔU ^o _R (kJ)	K ^o _a	0.00001772
Δa	ΔbT	ΔcT ²	-0.400	27.120	-0.216	-0.400	pKa	4.7515
-11.33	0.00	0.00						

		T		ΔH	
		(°C)	(K)	(kJ)	(J)
pKa	Ka	25	298.15	-0.4000	-400.00
4.7496	0.00001772	0.0	273.15	-0.1168	-116.75



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

$$\boxed{\frac{K_a}{C_0} = \frac{\alpha}{1-\alpha}}$$

Dilución
Ostwald

$$\frac{K_a}{C_0} > 10^{-1} = \text{ácido fuerte}$$

$$\frac{K_a}{C_0} < 10^{-1} = \text{ácido débil}$$

$$\frac{K_a}{C_0} < 10^{-1} < \frac{K_a}{C_0} 10^{-1} = \text{ácido Fra media}$$

acetato

$$pK_a + pK_b = pK_w$$

$$pK_b = pK_w - pK_a$$

$$pK_b = 14 - 4.75$$

$$= 9.25$$