

TP ELECTROQUIMICA

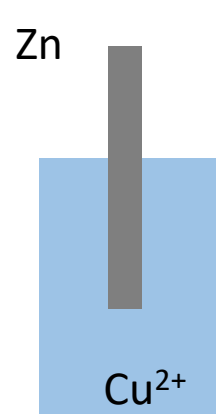
PILAS Y CELDAS ELECTROLITICAS

PARTE 1 – PILAS

Que son?

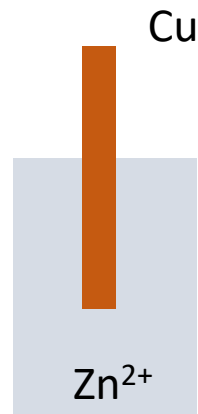
Reaccion quimica espontanea -> Welectrico

Que ocurre en cada caso:

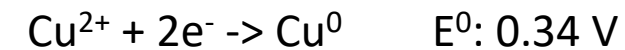
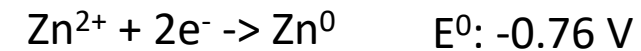


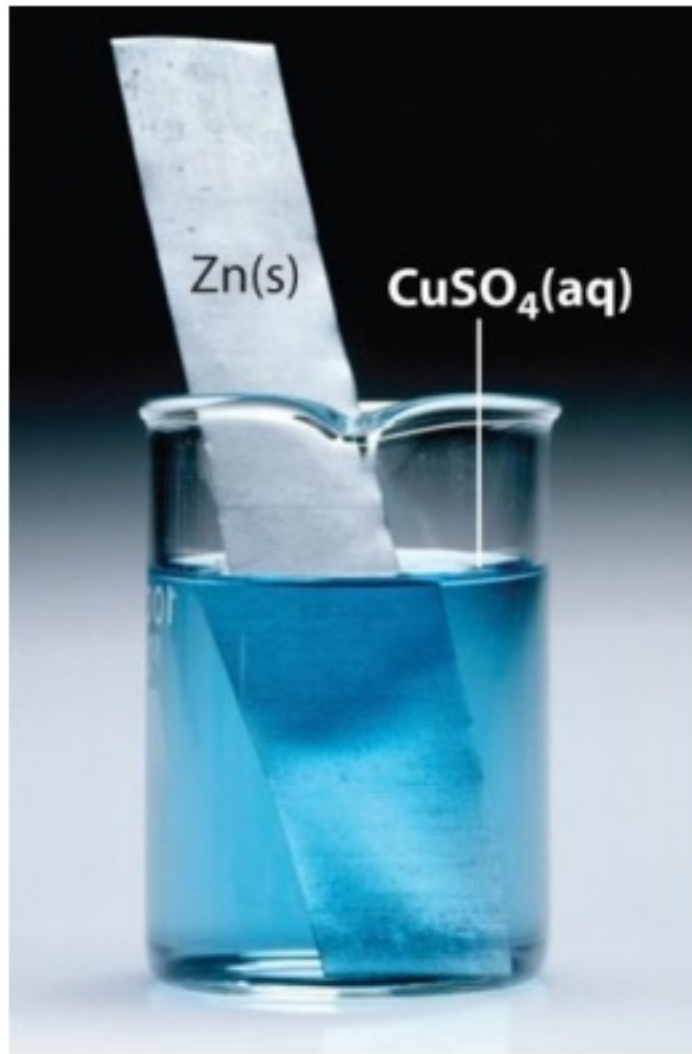
Hay reacción!

VS



No hay reacción!





Antes

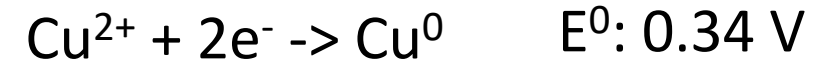
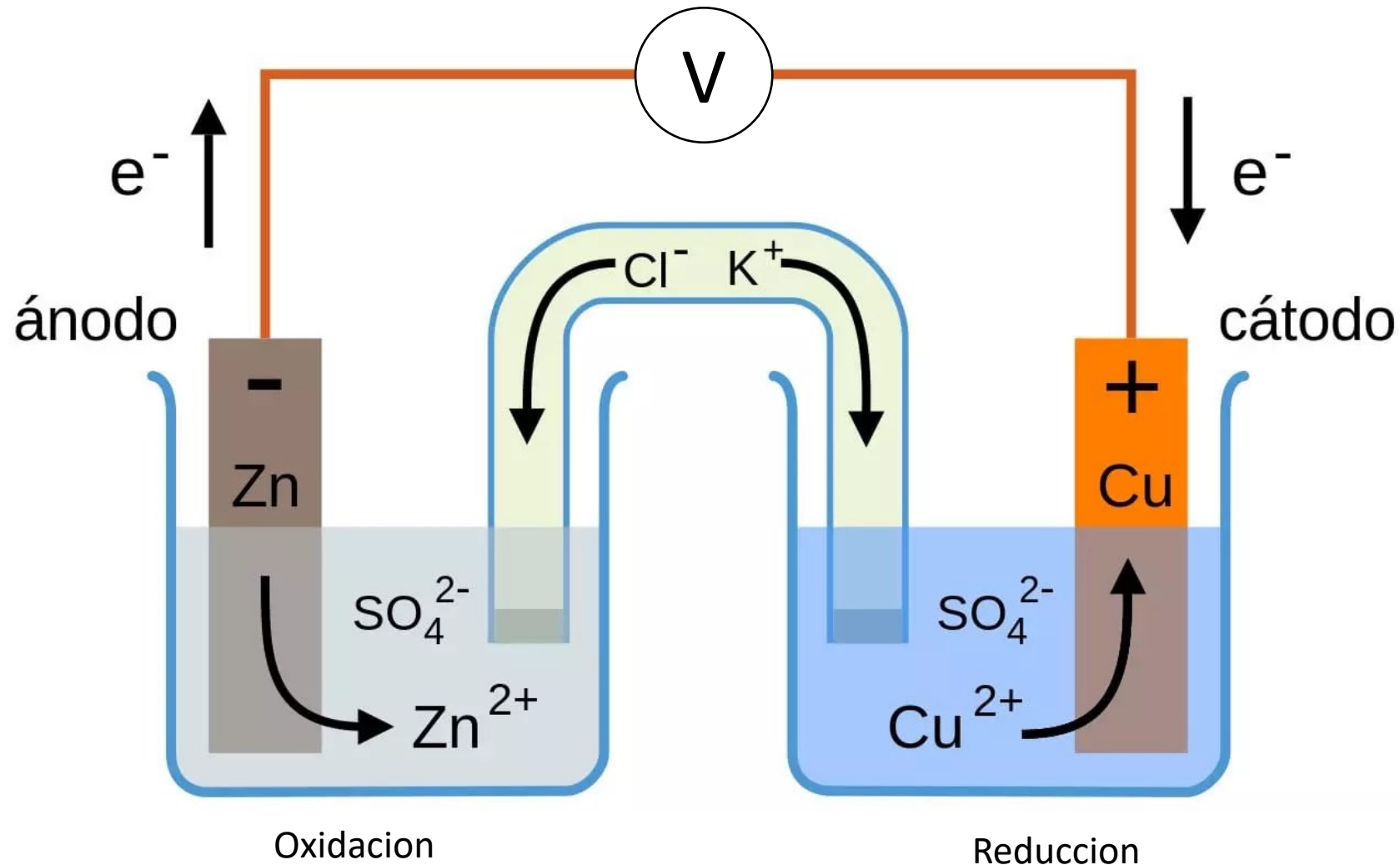


Despues

Es esto una pila???

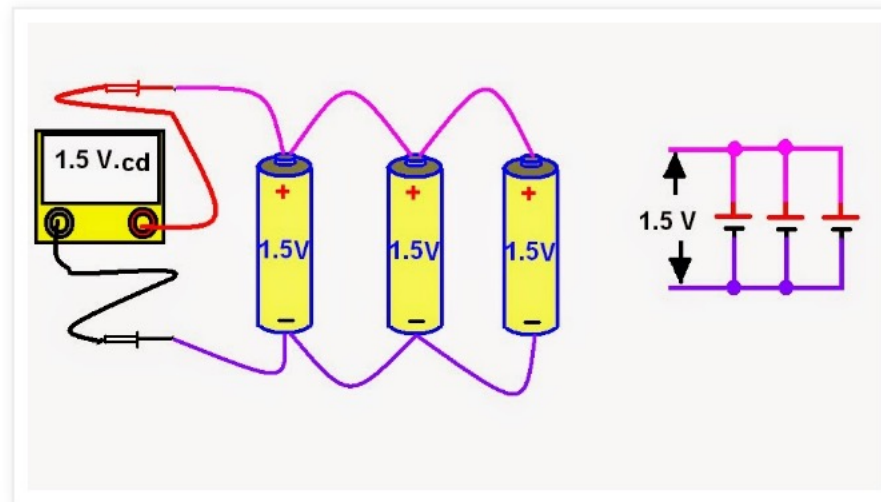
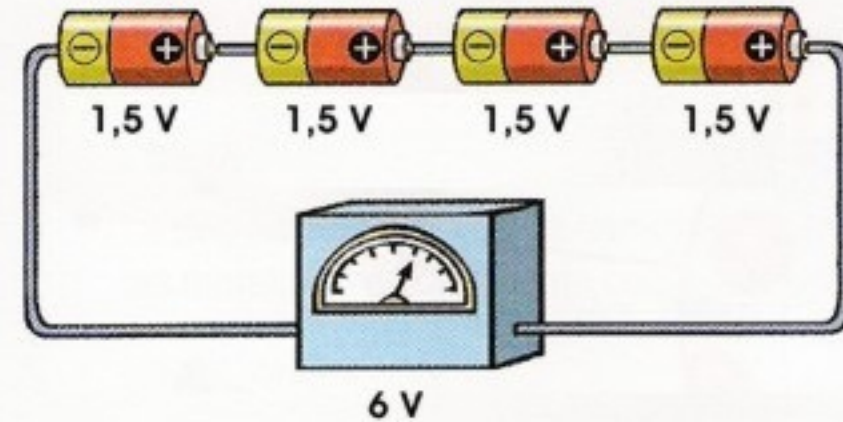
NO!!

Hay que separar las hemi-reacciones!!!



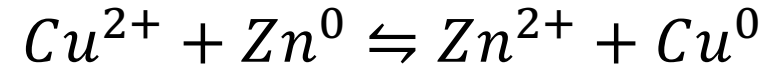
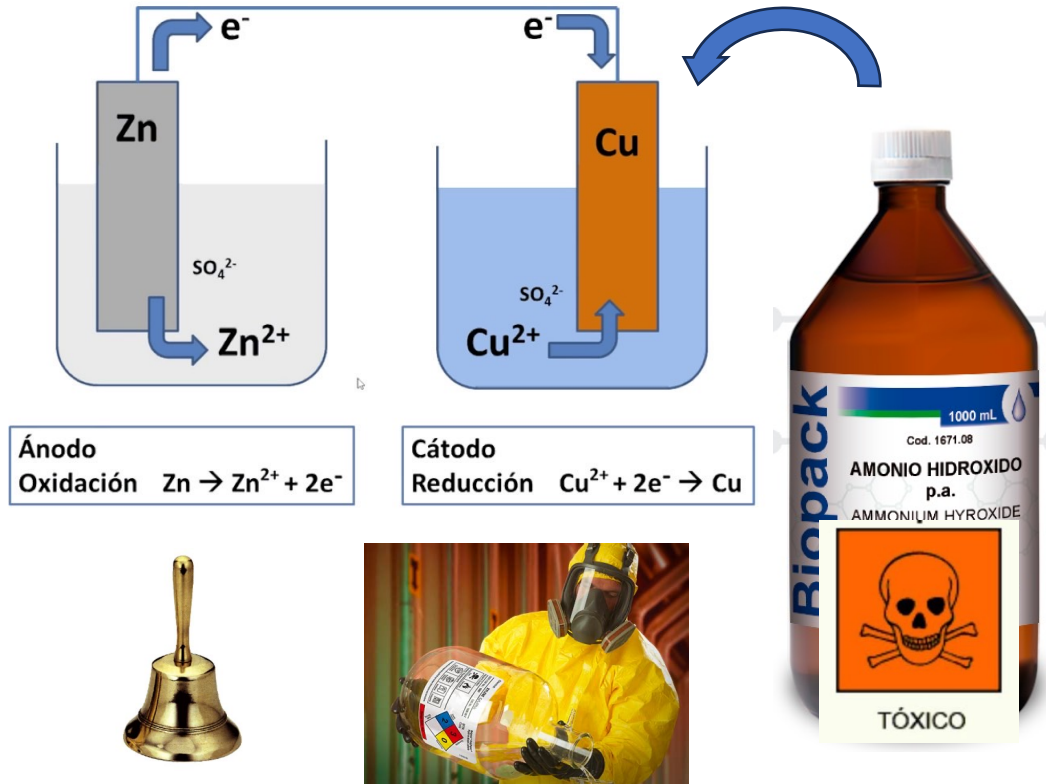
$$\Delta E^0 = E_{\text{catodo}}^0 - E_{\text{anodo}}^0 = 1.1 \text{ V}$$

Multimetro, conexiones en paralelo y en serie

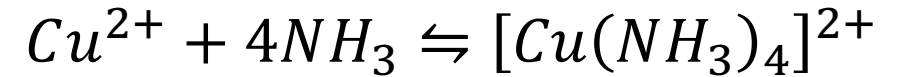


Agregado de amoniaco

Agregamos 5 mL de NH_3 14 mol/L al compartimento catodico (solucion de CuSO_4)



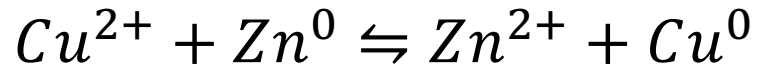
$$\Delta E = \Delta E^0 - \frac{RT}{nF} \ln \frac{[\text{Zn}^{2+}]_{eq}}{[\text{Cu}^{2+}]_{eq}}$$



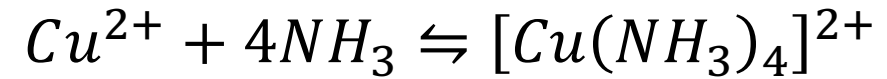
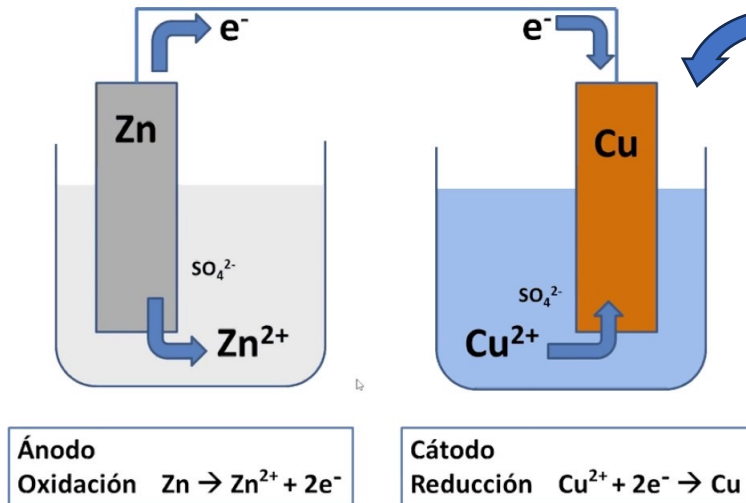
$$K_{eq} = \frac{[\text{Cu}(\text{NH}_3)_4]_{eq}^{2+}}{[\text{Cu}^{2+}]_{eq} [\text{NH}_3]_{eq}^4}$$

Agregado de amoniaco

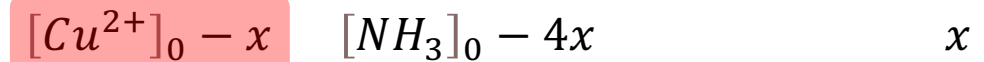
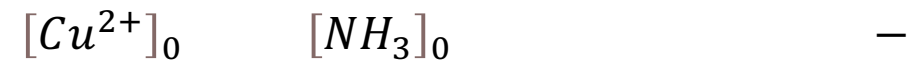
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$$\Delta E = \Delta E^0 - \frac{RT}{nF} \ln \frac{[\text{Zn}^{2+}]_{eq}}{[\text{Cu}^{2+}]_{eq}}$$



$$K_{eq} = \frac{[\text{Cu}(\text{NH}_3)_4]_{eq}^{2+}}{[\text{Cu}^{2+}]_{eq} [\text{NH}_3]_{eq}^4}$$



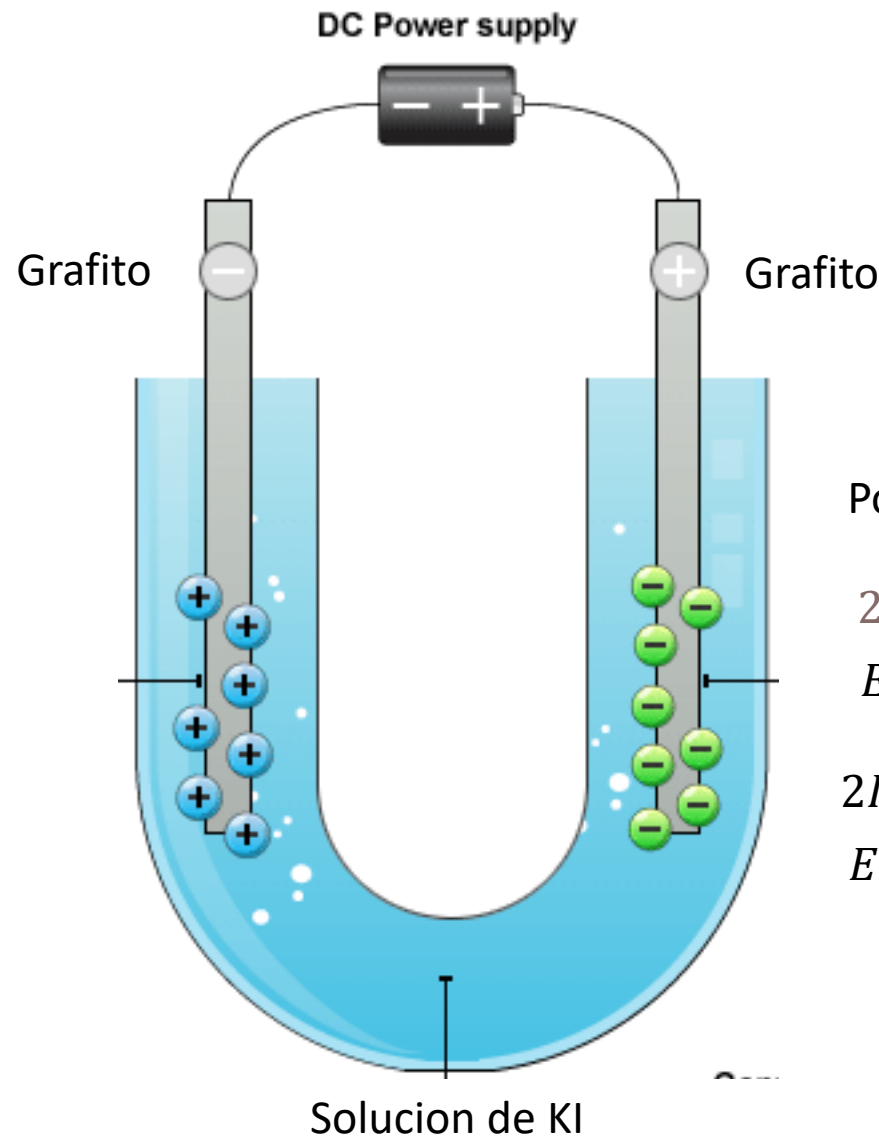
$$K_{eq} = \frac{x}{([\text{Cu}^{2+}]_0 - x)([\text{NH}_3]_0 - 4x)^4}$$

$$[\text{Cu}^{2+}]_0 - x = [\text{Cu}^{2+}]_{eq}$$

Tener en cuenta las diluciones para calcular las concentraciones iniciales

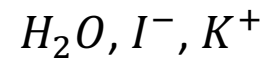
Electrolisis de KI(ac)

W_electrico -> reaccion quimica

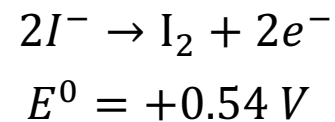
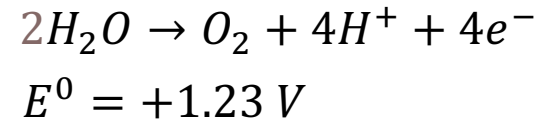


Recordar que la solución de KI era estable antes de aplicar trabajo eléctrico!!!

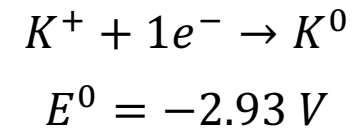
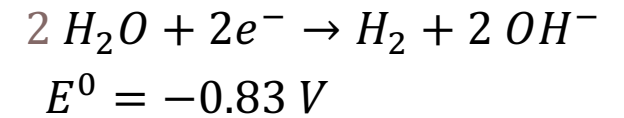
Especies en solución en cantidades significativas:



Posibles oxidaciones:

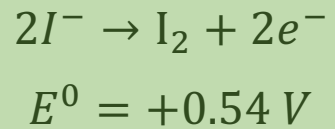
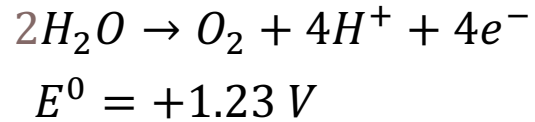


Posibles Reducciones:

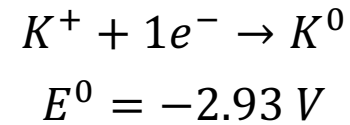
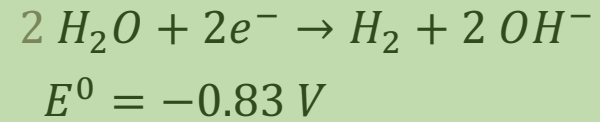


Electrolisis de KI(ac)

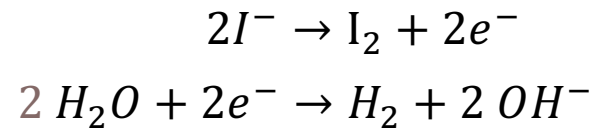
Posibles oxidaciones:



Posibles Reducciones:



REACCION GLOBAL:



???

LA REACCION ES ESPONTANEA?

$$\Delta E^0 = E_{catodo}^0 - E_{anodo}^0 = -0.83 - 0.54 = -1.37 V$$

