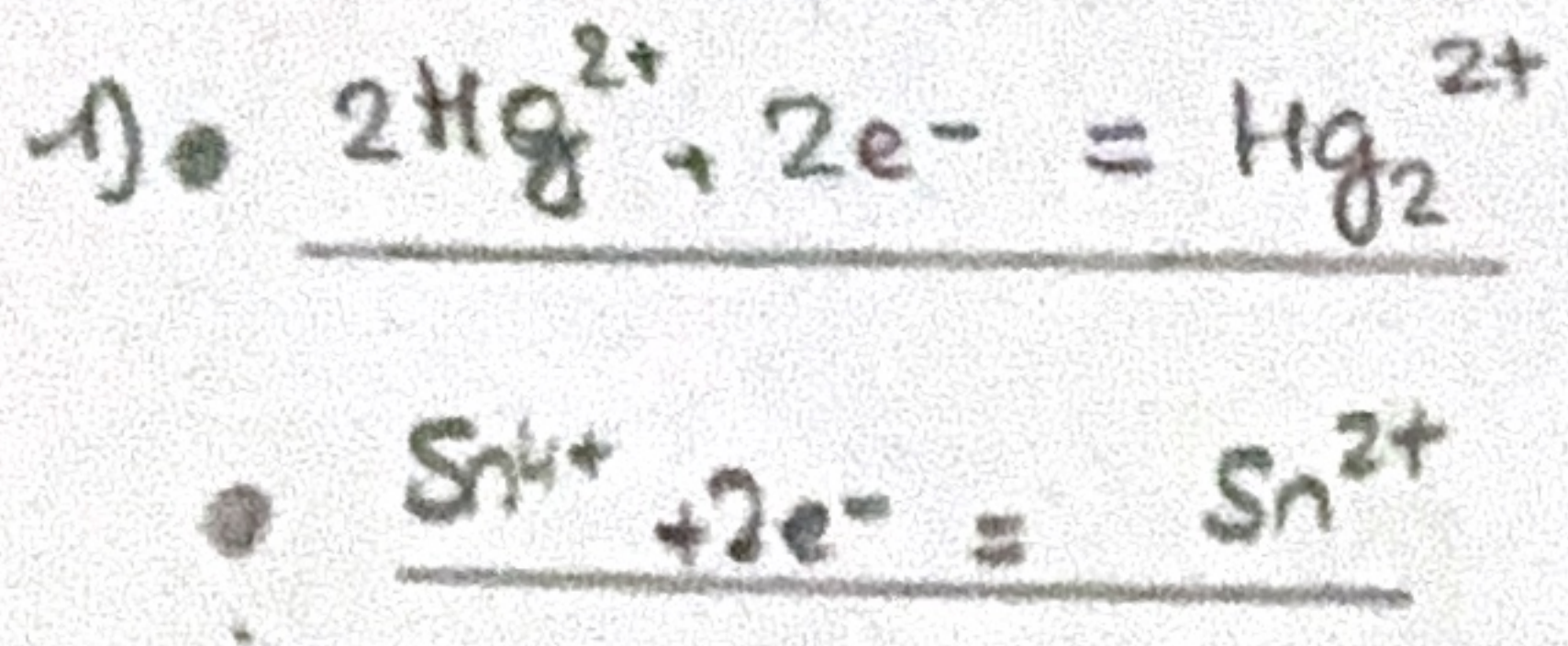
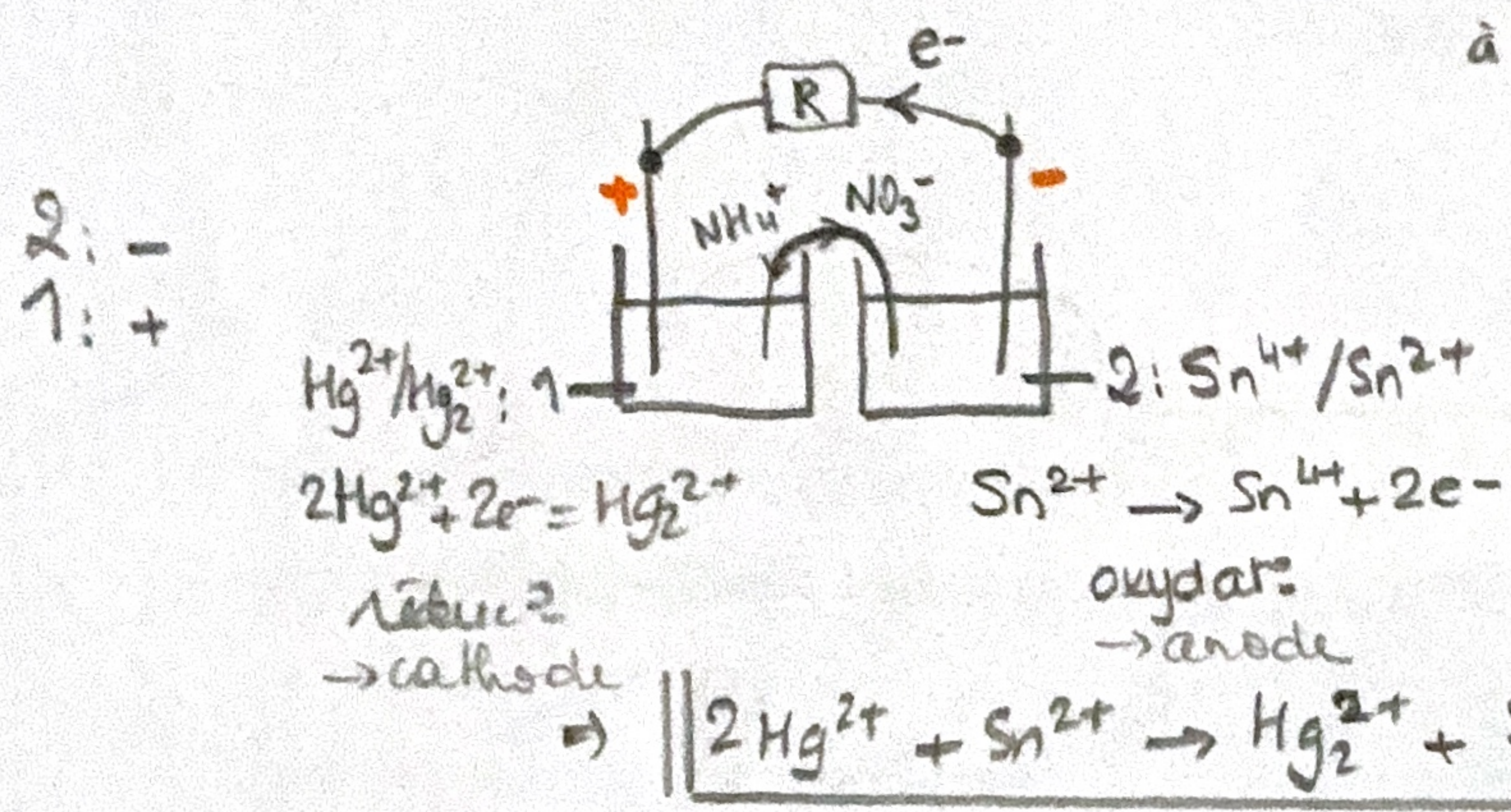


Pile Hg/Sn



relate de Nernst
 $E_1 = E_1^0 + \frac{\alpha}{2} \log \frac{[\text{Hg}^{2+}]^2}{[\text{Hg}_2^{2+}] \cdot c^0} = E_1^0 + \frac{\alpha}{2} \log \frac{10^2}{10 \cdot 10^{-2}} = E_1^0 + \frac{\alpha}{2} \times 2 = 0,91 + 0,06 = 0,97 \text{ V}$
 $E_2 = E_2^0 + \frac{\alpha}{2} \log \frac{[\text{Sn}^{4+}]}{[\text{Sn}^{2+}]} = E_2^0 + \frac{\alpha}{2} \log \frac{10 \cdot 10^{-2}}{10} = E_2^0 + \frac{\alpha}{2} \times (-2) = 0,15 - 0,06 = 0,09 \text{ V} < E_1$



2) arrêter pile : $E_1 = E_2$

	$2\text{Hg}^{2+} + \text{Sn}^{2+} \rightarrow \text{Hg}_2^{2+} + \text{Sn}^{4+}$			
Ei	$\frac{[\text{Hg}^{2+}] \cdot V}{m_{A1}}$	$\frac{[\text{Sn}^{2+}] \cdot V}{m_{A2}}$	$\frac{[\text{Hg}_2^{2+}] \cdot V}{m_{B1}}$	$\frac{[\text{Sn}^{4+}] \cdot V}{m_{B2}}$
Ef	$m_{A1} - 2Sf$	$m_{A2} - Sf$	$m_{B1} + Sf$	$m_{B2} + Sf$

$(m_{\text{Sn}^{2+}})_{\text{cons}} = Sf \Rightarrow (m_{e^-})_{\text{échangé}} = 2Sf \Rightarrow Q = \frac{2Sf \cdot \frac{\text{mol}}{\text{mol}} \cdot \frac{\text{mol}}{\text{mol}} \cdot e}{F}$

dér. de Sf avec $E_1 = E_2$

$E_1^0 + \frac{\alpha}{2} \log \frac{(C_{A1} - 2Sf)^2}{(C_{B1} + Sf) \cdot c^0} = E_2^0 + \frac{\alpha}{2} \log \frac{C_{B2} + Sf}{C_{A2} - Sf}$

$\log \frac{(C_{A1} - 2Sf)^2 \cdot (C_{A2} - Sf)}{(C_{B1} + Sf) \cdot (C_{B2} + Sf) \cdot c^0} = \frac{2}{\alpha} (E_2^0 - E_1^0)$

→ éq. du 3e de en Sf.

log: $\log \left(\frac{[\text{Hg}^{2+}]^2 \cdot [\text{Sn}^{2+}]}{[\text{Hg}_2^{2+}] \cdot [\text{Sn}^{4+}]} \right)_f = \log \left(\frac{1}{k^0} \right) = \frac{2}{\alpha} (E_2^0 - E_1^0)$

$\log k^0 = \frac{2}{\alpha} (E_1^0 - E_2^0)$

$\log k^0 = \frac{2}{0,06} (0,91 - 0,15) = 25,3$

$\rightarrow k^0 > 10^{25} > 10^3$
réac. totale.

réactif limitant: $\text{Hg}^{2+} \rightarrow Sf = \frac{1,0 \times 500 \cdot 10^{-3}}{2}$
 $Sf = 250 \cdot 10^{-3} \text{ mol}$

$\Rightarrow Q = 4,83 \cdot 10^3 \text{ C}$

3) cf schéma