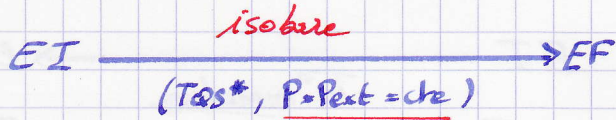


Ex T3-4:

$\delta = \{m \text{ mols de } N_2 \text{ assimilé à un gaz}\}$



$P_1 = 400 \text{ kPa}$   
 $= 4 \text{ bars}$

$P_2 = P_1$

$V_1 = 0,5 \text{ m}^3$

$V_2$

$T_1 = \Theta_1 + 273,15$

$T_2$

$$\begin{cases} Q = -Q_{ext} = -2800 \text{ J} \\ W_{elec} = \int \delta w = \int P_{elec} dt = \int_0^{\tau} E \cdot I \cdot dt = E I \tau = Q_S \\ \hspace{15em} = Q_S \end{cases}$$

$\delta = \{gaz\}$  1er Principe:  $\Delta U = W + \overbrace{Q_S}^{Q_{total}} + Q$

avec  $W =$  travail des forces pressantes.

$$W = \int -P_{ext} dV = - \int P_{ext} V = -P_1(V_2 - V_1) = -P_2 V_2 + P_1 V_1$$

$\uparrow$   $Q_S^*$        $\uparrow$   $P_{ext} = P_1$        $\uparrow$   $P_1 = P_2$

$\delta = \{gaz + résistance\}$  1er Principe:  $\Delta U = W + W^* + Q$        $\odot \Delta U - W = U_2 - U_1 + P_2 V_2 - P_1 V_1 = H_2 - H_1$   
car  $H = U + PV$

$\Delta H = W^* + Q_P$       *1er P. sur une ISOBARE*

travail reçu autre que celui des forces pressantes.

ici  $\Delta H = W_{elec} + Q$   
 $\Delta H = Q_S + Q$   
 $m \cdot c_p (T_2 - T_1) = E I \tau + Q$

$m = n \cdot M = \frac{P_1 V_1}{RT_1} M(N_2)$        $T_2 = \frac{1}{m \cdot c_p} (E I \tau + Q) + T_1$

$T_2 = \frac{RT_1}{P_1 V_1 M(N_2)} \frac{1}{c_p} (E \cdot I \cdot \tau - Q_{ext}) + T_1$

$\Delta c_p = 1,039 \text{ kJ/K/kg}$   
 $= 1,039 \cdot 10^3 \text{ J/K/kg}$

$M(N_2) = 2M(N) = 2 \cdot 14 = 28 \text{ g} \cdot \text{mol}^{-1}$   
 $= 28 \cdot 10^{-3} (\text{kg}) \cdot \text{mol}^{-1}$

USI pour l'AN