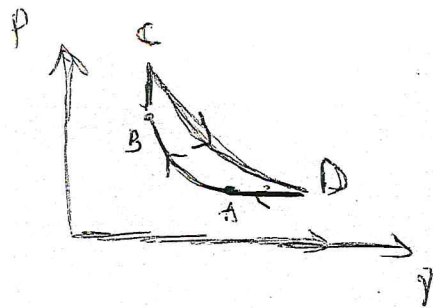


EX01

1)



(3)

2)  $\Delta U = Q + W$

(3)

EX02 (7)

1.  $n_{CO_2} = \frac{P_1 V_2}{R T_1} = \frac{4 \times 3}{0,082 \times 273,15} = 0,536 \text{ mol}$

$n_{O_2} = \frac{P_2 V_2}{R T_2} = \frac{6 \times 1}{0,082 \times 273,15} = 0,268 \text{ mol}$

$x_{CO_2} = \frac{n_{CO_2}}{n_T} = 0,66$

$x_{O_2} = 1 - 0,66 = 0,33$

$\Rightarrow P_T V_T = n_T R T_T \Rightarrow P_T = \frac{0,804 \times 0,082 \times 273,15}{4} \Rightarrow P_T = 4,5 \text{ atm}$

$\Rightarrow \bar{P}_1 = x_{CO_2} \times P_T = 3 \text{ atm} \quad / \quad \bar{P}_2 = x_{O_2} \times P_T = 1,5 \text{ atm}$

$M_0 = \frac{m_T}{V_T} = \frac{M_{CO_2} n_{CO_2} + M_{O_2} n_{O_2}}{V_T} = \frac{32,16}{4} \Rightarrow v_T = 8,04 \text{ g/l}$

(on peut calculer  $\bar{P}_1$  et  $\bar{P}_2$  à partir de  $\begin{cases} \bar{P}_1 V_T = n_{CO_2} R T \\ \bar{P}_2 V_T = n_{O_2} R T \\ P_T = \bar{P}_1 + \bar{P}_2 \end{cases}$ )

$T_T = 15^\circ C$

$v = ct \Rightarrow \frac{\bar{P}_T}{T_T} = \frac{P_T}{T} \Rightarrow \bar{T}_T = \frac{T}{\bar{P}_T} P_T = \frac{288,15}{273,15} \cdot 4,5 = 4,7 \text{ atm}$

$v_{T_0} = v_T$  car le volume ne change pas.

(7)

EX03

a) Isotherme  $\Rightarrow T_1 = T_2 = 27^\circ C = 300,15 / K$

$P = C^{ST} \Rightarrow P_1 V_1 = P_2 V_2 \Rightarrow P_2 = \frac{P_1 V_1}{V_2} = \frac{1 \times 8}{5} \Rightarrow P_2 = 1,6 \text{ atm}$

b)  $W = n R T \ln \frac{P_2}{P_1} = 0,082 \times 300,15 \ln \frac{1,6}{1} = 11,56 \text{ J}$