Exercice 3 :

1°// $PV = nRT \Rightarrow P = \frac{nRT}{V} = \frac{1 \times 0,082 \times 273}{0,2}$

$= 111,93$ atm

2°// gaz de Van der Waals

$$\left(P + \frac{an^2}{V^2}\right)(V - nb) = nRT$$

$$\left(P + \frac{2,17}{0,2 \times 0,2}\right)\left(V - 1 \times 4,18 10^{-2}\right) = 1 \times 0,082 \times 273$$

$P = 139,37$ atm

largement supérieure par rapport à la

Pression réelle $= 89,75$ atm

Exercice 4 :

Etat 1 : $\begin{cases} V_1 = 2\,l \\ T_1 = 298\,K \\ P_1 = 5 \text{ atm} \end{cases}$ Etat 2 $\begin{cases} V_2 = 10\,l \\ T_2 = T_1 \\ P_2 = \frac{P_1 V_1}{V_2} \end{cases}$

$= 1$ atm

1°// $\delta W = -P_{ex} dV \Rightarrow W = -\int_{V_1}^{V_2} nRT \frac{dV}{V} = -nRT \ln \frac{V_2}{V_1}$

$W_{rev} = -P_1 V_1 \ln \frac{V_2}{V_1} = -5 \times 2 \times \ln \frac{10}{2} = -16,09$ L.atm

$= -16,09 \times 101,3 = -1630,3$ J

2°// $\delta W = -P_{ex} dV \Rightarrow W_{irr} = -\int_{V_1}^{V_2} P_{ex} dV$

$W_{irr} = -P_2 (V_2 - V_1) = -1 \times (10 - 2) = -8$ L.atm

$= -8 \times 101,3$ J $= -810,4$ J