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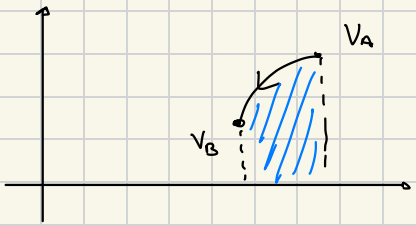
$n = 0{,}7$

$\ell = 3$

V_A

$V_B = \frac{4}{10} V_A$

$W_{AB} = -380\ J$ → negativo perché si comprime



$T_A = 305\ k$

$P_B = \frac{3}{2} P_A$

$P_A = 1{,}2 \cdot 10^5\ Pa$

$Q_{AB} = ?$ (Mi aspetto negativo)

✓

$\Delta U = Q_{AB} - W$

$\Delta U = \frac{\ell}{2} nR\Delta T = \frac{\ell}{2} nR(T_B - T_A)$

Per T_B uso $P_B V_B = nRT_B \rightsquigarrow \frac{P_B V_B}{nR} = T_B$

$$T_B = \frac{\frac{3}{2} P_A \cdot \frac{4}{10} V_A}{nR} = \frac{21}{20} \frac{P_A V_A}{nR} = \frac{21}{20} T_A$$

$$\Delta U = \frac{\ell}{2} nR \left(\frac{21}{20} T_A - T_A\right) = \frac{\ell}{2} nR T_A \frac{1}{20} = \frac{\ell}{40} nRT_A$$

$$Q_{AB} = \Delta U + W = \frac{\ell}{40} nRT_A - 380 \simeq -247{,}1\ J \simeq -59\ cal$$

$1\ J = 4{,}186\ Cal$

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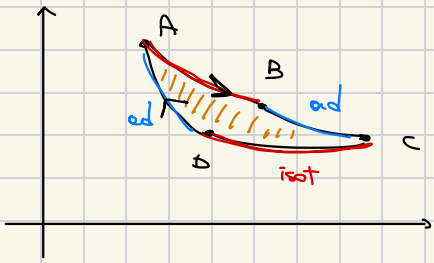
$n = 3{,}2\ mol$

Ciclo di Carnot: $\eta = 1 - \frac{T_1}{T_2}$



$V_A = 2{,}9 \cdot 10^{-2}\ m^3$

$T_2 = 450\ k = T_A = T_B$

$V_B = 5{,}1 \cdot 10^{-2}\ m^3$

$V_C = 6{,}7 \cdot 10^{-2}\ m^3$

$T_1 = T_C = T_D = 320\ k$

- V_D affinché sia di Carnot?
- Q_1, Q_2, η

- In un ciclo di Carnot vale che $\frac{V_C}{V_D} = \frac{V_B}{V_A}$ (segue dalla dim del rendim.)

Dato che ho i 3 volumi, ho che $V_D = \frac{V_A}{V_B} \cdot V_C \approx 3{,}8\ 10^{-2}\ m^3$

Modo BN. Guardo Adiabatica DA.

$T_f = \left(\frac{V_i}{V_f}\right)^{\gamma-1} T_i$ ⇝ $T_A = \left(\frac{V_D}{V_A}\right)^{\gamma-1} T_C$ $\qquad \gamma = \frac{f+2}{f} \Rightarrow \gamma - 1 = \frac{2}{f}$

$V_D^{\frac{2}{3}} = V_D^{\gamma-1} = V_A^{\gamma-1}\left(\frac{T_A}{T_C}\right) = V_A^{\frac{2}{3}}\left(\frac{T_A}{T_C}\right) \approx 0{,}13\ (m^3)^{\frac{2}{3}}$

Errore nel libro (Le temperature dovevano essere diverse)

- Q_{AB} è assorbito $Q_{AB} = W_{AB} = nRT_A \ln\left(\frac{V_B}{V_A}\right) \approx 6{,}7 \cdot 10^3\ J$

Q_{CD} è ceduto $Q_{CD} = W_{CD} = nRT_C \ln\left(\frac{V_D}{V_C}\right) \approx -4{,}8 \cdot 10^3\ J$

$\eta = 1 - \frac{T_1}{T_2} \approx 0{,}28$ $\qquad \eta = 1 - \frac{|Q_1|}{Q_2} \approx 0{,}28$