

Teste 3

11

Processo Adiabático

$$\text{CNPQ} \begin{cases} P_0 = 1 \text{ atm} = 101300 \text{ Pa} \\ T_0 = 0^\circ\text{C} = 273 \text{ K} \end{cases}$$

$$\gamma = 1.4$$

$$n = \frac{m}{M} = \frac{14}{20} = 0.5 \text{ mols}$$

$$P_0 V_0 = n R T_0$$

$$101300 \cdot V_0 = 0.5 \cdot 8.31 \cdot 273$$

$$V_0 = 0.011 \text{ m}^3$$

$$P_0 V_0^\gamma = P_f V_f^\gamma$$

$$P_f V_f = n R T_f$$

$$0.1 \cdot 101300 \cdot 0.058 = 0.5 \cdot 8.31 \cdot T_f$$

$$T_f = 141.4 \text{ K}$$

$$1 \cdot 0.011^{1.4} = 0.1 \cdot V_f^{1.4}$$

$$V_f = 0.058 \text{ m}^3$$

(a)

$$(b) \Delta E_{\text{int}} = Q + W$$

$$n C_v \Delta T = W$$

$$W = 0.5 \cdot 20.8 \cdot (141.4 - 273)$$

$$W = -1368.64 \text{ J}$$

(c) Processo Adiabático

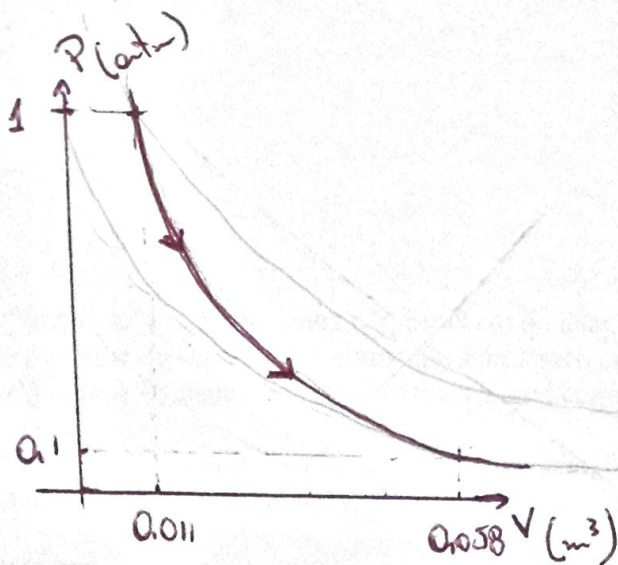
Não ocorre troca de

Calor

(d)

$$Q = 0$$

(e)



TESTE 3 F1

COMPRESSÃO: $V \rightarrow \frac{V}{2}$; $W = 700 \text{ J}$; Processo Isotérmico

$$(a) \quad W = - \int_{V_0}^{V_0/2} p \, dV \rightarrow W = - \int_{V_0}^{V_0/2} \frac{1}{2} nRT \cdot \frac{dV}{V} \rightarrow W = - nRT \ln\left(\frac{1}{2}\right)$$

$$700 = - nRT \cdot \ln\left(\frac{1}{2}\right)$$

$$- nRT = - 1.009,9$$

$$W = - nRT \cdot \ln\left(\frac{1}{10}\right)$$

$$W = - 1.009,9 \cdot (-2,3)$$

$$\boxed{W = 2.325,35 \text{ J}}$$

$$(b) \quad \Delta E_{\text{int}} = Q + W$$

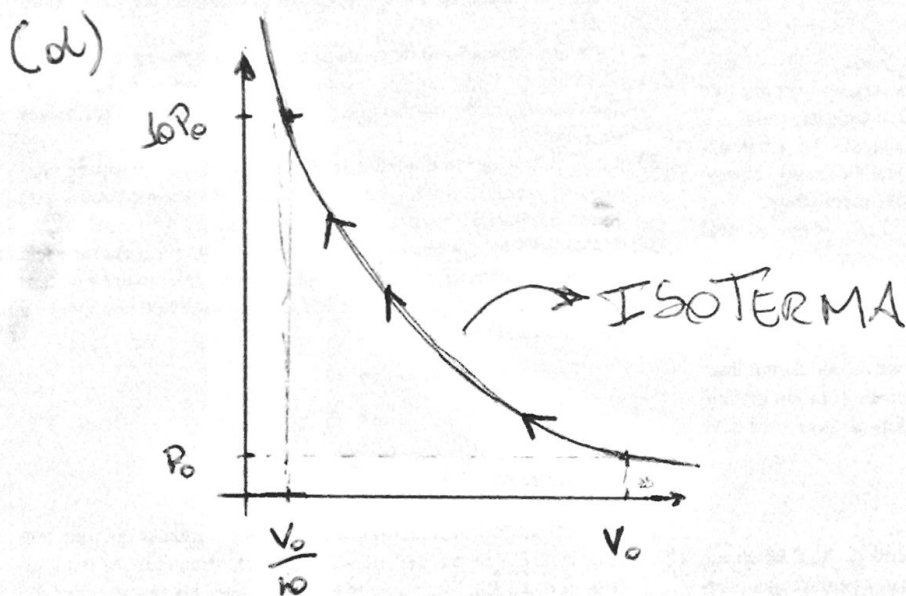
$$Q = -W$$

$$Q = - 2.325,35 \text{ J}$$

$$(c) \quad \Delta E_{\text{int}} = 0$$

Processo Isotérmico

CEDE CALOR



cede
cede