

1º Pencil

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②



Agua

$$m = 3.34 \text{ [kg]}$$

$$m_F = 3000 \text{ [kg]}$$

$$A_E = 29.4 \text{ [cm}^2\text{]} \cdot \frac{1 \text{ m}}{100 \text{ cm}} \cdot \frac{1 \text{ m}}{100 \text{ cm}} = 2.94 \times 10^{-3} \text{ [m}^2\text{]}$$

Estado 1

$$P_1 = 300 \text{ [kPa]} \rightarrow T_{E0} = 133.55^\circ\text{C} \quad X_1 < 0$$

$$T(40^\circ\text{C}) \rightarrow v_L = 0.001026 \quad v_L = 317.51 \text{ [kJ/kg]}$$

$$v = \frac{V}{m} \rightarrow v = v_L = 3.34 (0.001026)$$

$$V = 0.00342684 \text{ [m}^3\text{]}$$

Estado 2

$$P_E = \frac{m \cdot g}{A} = \frac{3000 (9.8)}{2.94 \times 10^{-3}} = 1000000 \text{ [Pa]} \cdot \frac{1 \text{ [kPa]}}{1000 \text{ [Pa]}} = 1000 \text{ [kPa]}$$

$$P_2 = 1000 + 300 = 1300 \text{ [kPa]} \rightarrow T_{E0} = 191.64^\circ\text{C}$$

$$T_2 = 140^\circ\text{C} \rightarrow v_L = 0.001053$$

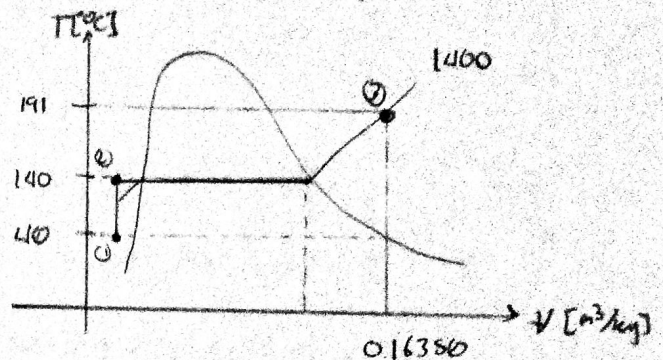
Estado 3

$$V_m = 0.546 \text{ [m}^3\text{]}$$

$$v = \frac{V}{m} = \frac{0.546}{3.34} = 0.16347$$

$$P_3 = 1300 \text{ [kPa]} \rightarrow \begin{cases} T = 191.64 \\ v_L = 0.001144 \\ v_v = 0.15125 \end{cases}$$

$$X_3 > 1 \rightarrow P[1400 \text{ kPa}] \begin{cases} T_3 = 250^\circ\text{C} \\ v = 0.16350 \\ u = 2698.32 \end{cases}$$



Tinbat

$${}_1w_3 = \cancel{{}_1w_2} + \cancel{{}_2w_3}$$

$${}_1w_3 = {}_2w_3 = \int_2^3 {}_2P_3 dv = {}_2P_3 (v_3 - v_2)$$

$${}_1w_3 = 1300 \text{ [kPa]} (0.546 - 0.0034)$$

$${}_1w_3 = 705.3451 \text{ [kJ]}$$

Calor:

$$\Delta U = Q - W$$

$$Q = \Delta U + W$$

$$\begin{aligned} Q &= U_3 - U_1 + W = u_3 m - u_1 m + W \\ &= m(u_3 - u_1) + W \end{aligned}$$

$$Q = 3.34 (2698.32 - 317.51) + 705.3451$$

$$Q = 8657.2505 \text{ [kJ]}$$

$$W = 705.34 \text{ [kJ]}$$

$$Q = 8657.25 \text{ [kJ]}$$