

2do Parcial

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3)

$$T_{ev} = 246^{\circ}\text{C}$$

$$T_{co} = 45^{\circ}\text{C}$$

$$T_1 = 400^{\circ}\text{C}$$

$$x_3 = 0$$

$$s_1 = s_2$$

$$W_T = 200000 \text{ [W/sq]}$$

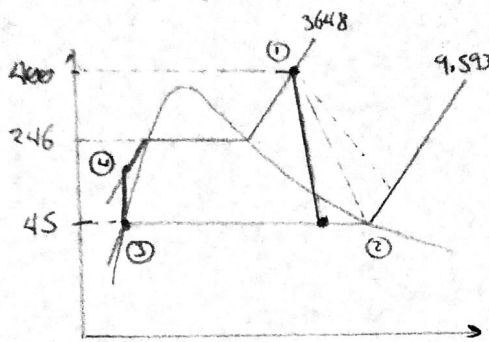
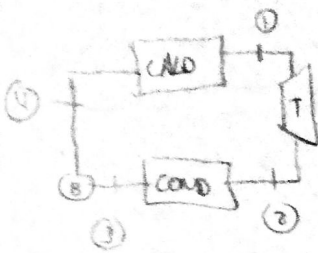
$${}_1\dot{Q}_1 = ?$$

$${}_2\dot{Q}_3 = ?$$

$$\eta = ?$$

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molto ideal



$$T(246) \Rightarrow 3648,2 \text{ [kPa]}$$

$$T(45) \Rightarrow 9,593 \text{ [kPa]}$$

$$\textcircled{1} \quad T_1 = 400^{\circ}\text{C} \quad \left\{ \begin{array}{l} h_1 = 3213,15 \text{ [kJ/kg]} \\ s_1 = 6,7689 \text{ (kJ/kgK)} \end{array} \right.$$

$$\textcircled{2} \quad P_2 = 9,593 \text{ [kPa]} \quad \left\{ \begin{array}{l} s_2 = 6,7689 \\ s_2 = 0,6492 \\ s_2 = 8,1501 \end{array} \right.$$

$$x_2 = \frac{6,7689 - 0,6492}{8,1501 - 0,6492} = 0,816$$

$$h_2 = 191,81$$

$$h_v = 2584,63$$

$$h_2 = 191,81 + (0,816)(2584,63 - 191,81) = 2144,08 \text{ [kJ/kg]}$$

$$\textcircled{3} \quad x_3 = 0 \quad \left\{ \begin{array}{l} h_3 = 188,42 \text{ [kJ/kg]} \\ v_3 = 0,001010 \text{ [m}^3\text{/kg]} \end{array} \right.$$

$$T_3 = 45^{\circ}\text{C}$$

$$\textcircled{4} \quad h_4 - h_3 = v_3(P_4 - P_3)$$

$$h_4 = h_3 + v_3(P_4 - P_3) = 188,42 + 0,001010(3638,600)$$

$$h_4 = 192,095 \text{ [kJ/kg]}$$

$$W_T = \dot{m}(h_1 - h_2)$$

$$\dot{m} = \frac{W_T}{h_1 - h_2} = \frac{200000}{3213,5 - 2144,08}$$

$$\dot{m} = 18,71 \text{ [kg/s]}$$

$${}_1\dot{Q}_1 = \dot{m}(h_1 - h_4)$$

$$= 56517,43 \text{ [kW]}$$

$${}_2\dot{Q}_3 = \dot{m}(h_2 - h_3)$$

$$= 36586,18 \text{ [kW]}$$

$${}_3\dot{W}_v = \dot{m}(h_4 - h_3)$$

$$= 68,75 \text{ [kW]}$$

$$\eta = \frac{W_T}{{}_1\dot{Q}_1 + {}_3\dot{W}_v} = 0,3534$$

$$= 35,34\%$$