

2^{do} Parcial

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[ing. Electromecánica]

4)

Pollo: $30^{\circ}\text{C} \rightarrow 4^{\circ}\text{C}$

$$C_p = 3.76 \left[\frac{\text{kJ}}{\text{kg}^{\circ}\text{C}} \right]$$

8371 pollos $\rightarrow 1 [\text{hr}]$

1 pollo $\rightarrow 2.5 [\text{kg}]$

4 personas

1 persona $\rightarrow 625 [\text{kcal/hr}]$

$$\dot{Q}_p = 8371 [\text{pollos}] \cdot \frac{2.5 [\text{kg}]}{1 [\text{pollo}]} = 20927.5 [\text{kg}]$$

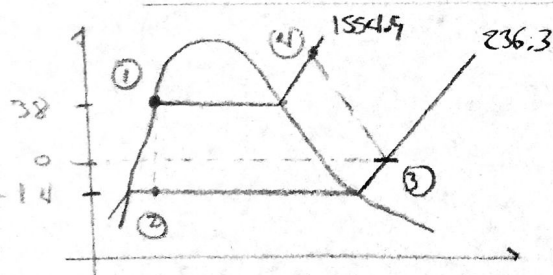
$$\dot{Q}_p = \frac{m_p}{t_p} C_p (T_F - T_I) = \frac{20927.5 [\text{kg}]}{1 [\text{hr}]} \cdot 3.76 \left[\frac{\text{kJ}}{\text{kg}^{\circ}\text{C}} \right] (30^{\circ}\text{C} - 4^{\circ}\text{C})$$

$$\dot{Q}_p = 2045872.4 \left[\frac{\text{kJ}}{\text{hr}} \right] = 568.298 \left[\frac{\text{kJ}}{\text{s}} \right]$$

\dot{Q}_T

$$\dot{Q}_T = 4 \left(625 \left[\frac{\text{kcal}}{\text{hr}} \right] \cdot \frac{4.1868 [\text{kJ}]}{1 [\text{kcal}]} \right) = 10467 \left[\frac{\text{kJ}}{\text{h}} \right] = 2.9075 [\text{kW}]$$

$$\dot{Q}_{\text{co}} = \dot{Q}_p + \dot{Q}_T = 571.2055 [\text{kW}]$$



NH3

$$T_{\text{ev}} = -14^{\circ}\text{C}$$

$$T_{\text{cd}} = 38^{\circ}\text{C}$$

$$s_3 = s_4$$

$$x_1 = 0$$

$$T_3 = 0$$

$${}_3\dot{W}_4 = ?$$

$${}_4\dot{Q}_1 = ?$$

$$\text{COP} = ?$$

$$\textcircled{1} \quad X_1 = 0 \quad \left\{ \begin{array}{l} h_1 = 371.43 \left[\frac{\text{kJ}}{\text{kg}} \right] \\ T_1 = 38^\circ\text{C} \quad (\text{sat}) \end{array} \right.$$

$$\textcircled{2} \quad h_2 = h_1 \quad \left\{ \begin{array}{l} h_2 = 371.43 \left[\frac{\text{kJ}}{\text{kg}} \right] \end{array} \right.$$

$$\textcircled{3} \quad \begin{array}{l} T_3 = 0^\circ\text{C} \\ P_3 = 236.3 \text{ [kPa]} \quad (\text{sat}) \end{array} \quad \left\{ \begin{array}{l} h_3 = 1463.8 \left[\frac{\text{kJ}}{\text{kg}} \right] \\ s_3 = 5.7659 \left[\frac{\text{kJ}}{\text{kg} \cdot \text{K}} \right] \end{array} \right.$$

$$\textcircled{4} \quad s_4 = s_3$$

$$\begin{array}{l} P_4 = 1554.9 \text{ [kPa]} \quad (\text{sat}) \\ s_4 = 5.7659 \left[\frac{\text{kJ}}{\text{kg} \cdot \text{K}} \right] \end{array} \quad \left\{ \begin{array}{l} T_4 = 160^\circ\text{C} \\ h_4 = 1798.7 \end{array} \right.$$

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

$$\dot{m} = \frac{571.2055}{1463.8 - 371.43} = 0.5229 \left[\frac{\text{kg}}{\text{s}} \right]$$

$$\dot{W}_4 = \dot{m} (h_4 - h_3) = 175.12 \text{ [kW]}$$

$$\dot{Q}_1 = \dot{m} (h_4 - h_1) = 746.32 \text{ [kW]}$$

$$\text{COP} = \frac{\dot{Q}_3}{\dot{W}_4} = \frac{571.2055}{175.12} = 3.2618$$