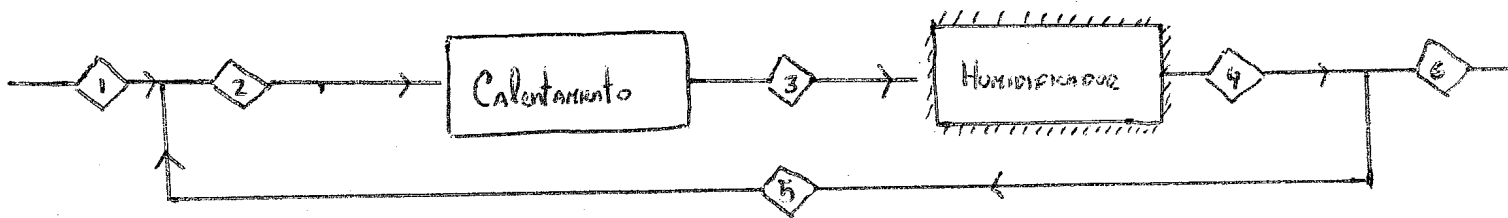


3-



Datos:

$$V_{G1} = 1000 \text{ m}^3$$

$$T_{G1} = 20^\circ\text{C}$$

$$\phi_1 = 40\%$$

$$T_{G6} = 35^\circ\text{C}$$

$$\phi_6 = 60\%$$

$$m_5 = 0,25 \text{ m}^4$$

$$m_6 = 0,75 \text{ m}^4$$

$$V_{G1} = 35319,67 \text{ ft}^3$$

① A partir de  $T_{G1}$  y  $\phi_1$  se calculan las propiedades de la corriente 1:

$$T_{G1} = 68^\circ\text{F}$$

$$\phi_1 = 40\%$$

 $\Rightarrow$ 

$$Y_1 = 0,0058 \frac{\text{lb}}{\text{lbas}}$$

$$H_1 = 22,8 \frac{\text{BTU}}{\text{lb}}$$

$$V_{H1} = 13,42 \frac{\text{ft}^3}{\text{lbas}}$$

$$G_s = \frac{V_{G1}}{V_{H1}} = \frac{35319,67 \text{ ft}^3}{13,42 \frac{\text{ft}^3}{\text{lbas}}}$$

$$G_s = 2631,50 \text{ lbas}$$

② A partir de  $T_{G6}$  y  $\phi_6$  se calculan las propiedades de la corriente 6:

$$T_{G6} = 95^\circ\text{F}$$

$$\phi_6 = 60\%$$

 $\Rightarrow$ 

$$Y_6 = 0,0716 \frac{\text{lb}}{\text{lbas}}$$

$$H_6 = 46,6 \frac{\text{BTU}}{\text{lb}}$$

### 3: BALANCES DE MASA

$$m_5 + m_1 = m_2$$

$$m_2 = m_3 = m_4$$

$$m_4 = m_5 + m_6$$

$$m_1 = m_6 = 0,75 m_4$$

$$m_4 = \frac{m_1}{0,75} = \frac{2631,50 \text{ lbas}}{0,75}$$

$$m_4 = 3508,67 \text{ lbas}$$

$$m_5 = m_4 - m_1$$

$$m_5 = 377,17 \text{ lbas}$$

### 4: Balance de masa por componente

Se sabe que:  $Y_2 = Y_3$

$$Y_4 = Y_5 = Y_6$$

$$m_5 Y_5 + m_1 Y_1 = m_2 Y_2$$

$$Y_2 = \frac{m_5 Y_5 + m_1 Y_1}{m_2}$$

$$Y_2 = 0,00975 \frac{\text{lb}}{\text{lbas}}$$

5- Cálculo del agua empleada en el Humidificador.

$$m_3 Y_3 = m_4 Y_4 - m_{H_2O}$$

$$m_{H_2O} = m_4 (Y_4 - Y_3)$$

$$m_{H_2O} = 41,58 \text{ lb}$$

6- Balance de Energía

$$Q + m_2 H_2 = m_3 H_3$$

$$Q = m_2 (H_3 - H_2)$$

$$m_1 H_1 + m_5 H_5 = m_2 H_2$$

Separador Ideal

$$H_4 = H_5 = H_6$$

$$T_4 = T_5 = T_6$$

Humidificador Adiabático

$$H_3 = H_4$$

De la curva psicrométrica con  $Y_3 = 0,0216 \frac{\text{lb}}{\text{lb.}}$  y  $T_5 = 95^\circ\text{F}$  calculo

$$H_5 = 46,7 \frac{\text{BTU}}{\text{lb.}}$$

$$H_2 = \frac{m_1 H_1 + m_5 H_5}{m_2}$$

$$H_2 = 28,75 \frac{\text{BTU}}{\text{lb.}}$$

$$Q = m_2 (H_3 - H_2)$$

$$Q = 62629,76 \text{ BTU}$$

2- Ahora Bien de la carta psicrométrica calculo  $t_{c2}$  y  $T_{c3}$

$$\begin{aligned} * \quad H_2 &= 28,75 \frac{\text{BTU}}{\text{lb}} \\ Y_2 &= 0,00975 \frac{\text{lb}}{\text{lbs}} \end{aligned} \Rightarrow T_{c2} = 75^\circ\text{F} \text{ (Normal Temperature)}$$

$$\begin{aligned} * \quad H_3 &= 46,6 \frac{\text{BTU}}{\text{lb}} \\ Y_3 &= 0,00975 \frac{\text{lb}}{\text{lbs}} \end{aligned} \Rightarrow T_{c3} = 148^\circ\text{F} \text{ (High Temperature)}$$