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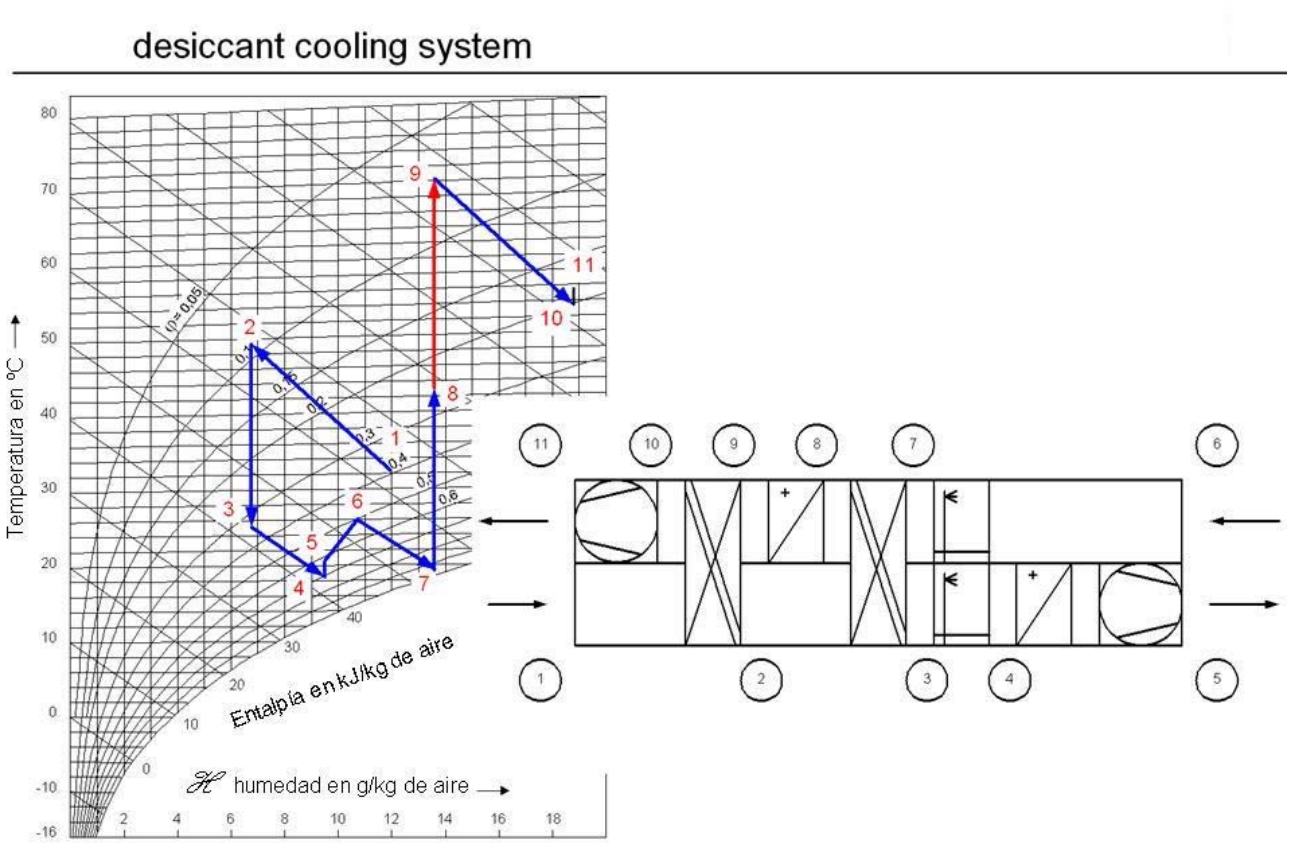

Ciclo de refriferación por adsorción utilizando energía térmica solar
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Adsorbedor

$T_1 = 31$ [C]

$P = 101{,}3$ [kPa]

$x_1 = 0{,}4$

$h_1 = \mathbf{h}\left['AirH2O' ; T = T_1 ; P = P ; R = x_1\right]$

$w_1 = \omega\left['AirH2O' ; T = T_1 ; R = x_1 ; P = P\right]$

$T_1 = T_1$

$\dot{m}_1 = \frac{1}{2{,}198} \cdot 1$ [kg/s]

$x2 = 0{,}1$

$\mathbf{h}\left['AirH2O' ; T = T2 ; P = P ; R = x2\right] = h_1$

$w_2 = \omega\left['AirH2O' ; T = T2 ; P = P ; R = x2\right]$

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$T_2 = T2 + 2$ [C]

$h_2 = \mathbf{h}['AirH2O'; T = T_2; P = P; w = w_2]$

$w_2 = w_2$

$T_2 = T_2$

Enfriador

$w_3 = w_2$

$T_3 = 25$ [C]

$h_3 = \mathbf{h}['AirH2O'; T = T_3; P = P; w = w_3]$

$Q_{enf} = [h_2 - h_3] \cdot \dot{m}_1$

$w_3 = w_3$

$T_3 = T_3$

Enfriamiento por saturación parcial adiabática

$T_4 = 18$ [C]

$h_4 = h_3$

$\mathbf{h}['AirH2O'; T = T_4; P = P; w = w_4] = h_4$

$x_4 = \mathbf{RH}['AirH2O'; T = T_4; P = P; w = w_4]$

$Q_{frío} = [h_1 - h_4] \cdot \dot{m}_1$

$w_4 = w_4$

$T_4 = T_4$

Variación de temperatura y humedad del aire en el local

$T_6 = T_4 + 8$ [C]

$x_6 = x_4 + 0{,}2$

$h_6 = \mathbf{h}['AirH2O'; T = T_6; P = P; R = x_6]$

$T6 = \mathbf{WB}['AirH2O'; T = T_6; P = P; R = x_6]$

$w_6 = \omega['AirH2O'; T = T_6; P = P; R = x_6]$

$T_6 = T_6$

Enfriamiento por saturación parcial adiabática

$h_7 = h_6$

$T_7 = T6$

$\mathbf{h}['AirH2O'; T = T_7; P = P; w = w_7] = h_6$

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$w_7 = w_7$

$T_7 = T_7$

Intercambiador de calor

$\dot{m}_1 \cdot [h_8 - h_7] = \dot{m}_1 \cdot [h_2 - h_3]$

$w_8 = w_7$

$h_8 = \mathbf{h}['AirH2O'; T = T_8; P = P; w = w_7]$

$\varepsilon = \frac{T_8 - T_7}{T_2 - T_3}$

$w_8 = w_8$

$T_8 = T_8$

Calor de desorción

$w_9 = w_8$

$T_9 = 75$ [C]

$h_9 = \mathbf{h}['AirH2O'; T = T_9; P = P; w = w_9]$

$Q_{solar} = [h_9 - h_8] \cdot \dot{m}_1$

$w_9 = w_9$

$T_9 = T_9$

Desorción

$x_{10} = 0{,}18$

$\mathbf{h}['AirH2O'; T = T10; P = P; R = x_{10}] = h_9$

$T_{10} = T10 - 2$ [C]

$w_{10} = \omega['AirH2O'; T = T_{10}; P = P; R = x_{10}]$

$h_{10} = \mathbf{h}['AirH2O'; T = T_{10}; P = P; w = w_{10}]$

$w_{10} = w_{10}$

$T_{10} = T_{10}$

Rendimiento global

$COP = \frac{Q_{frío}}{Q_{solar}}$

SOLUTION
Unit Settings: [kJ]/[C]/[kPa]/[kg]/[degrees]

COP = 0,647
h_1 = 60,0 [kJ/kg]
h_2 = 62,0 [kJ/kg]
h_4 = 40,0 [kJ/kg]
h_7 = 73,4 [kJ/kg]
h_9 = 126,3 [kJ/kg]
P = 101,3 [kPa]
$Q_{frío}$ = 9,08 [kW]
T10 = 61,55 [C]
T6 = 24,32 [C]
T_2 = 46,61 [C]
T_4 = 18 [C]
T_7 = 24,32 [C]
T_9 = 75 [C]
T_1 = 31,0 [C]
T_2 = 46,6 [C]
T_4 = 18,0 [C]
T_7 = 24,3 [C]
T_9 = 75,0 [C]
w_2 = 0,005826
w_4 = 0,008636
w_7 = 0,01923
w_9 = 0,01923
w_{10} = 0,02235
w_3 = 0,005826
w_7 = 0,01923
w_9 = 0,01923
x_1 = 0,400
x_4 = 0,672

ε = 0,976
h_{10} = 118,3 [kJ/kg]
h_3 = 40,0 [kJ/kg]
h_6 = 73,4 [kJ/kg]
h_8 = 95,4 [kJ/kg]
$\dot{m}_1$ = 0,45496 [kg/s]
Q_{enf} = 10,01 [kW]
Q_{solar} = 14,04 [kW]
T2 = 44,61 [C]
T_1 = 31 [C]
T_3 = 25 [C]
T_6 = 26 [C]
T_8 = 45,41 [C]
T_{10} = 59,55 [C]
T_{10} = 59,55 [C]
T_3 = 25,0 [C]
T_6 = 26,0 [C]
T_8 = 45,4 [C]
w_1 = 0,01124
w_3 = 0,005826
w_6 = 0,01854
w_8 = 0,01923
w_{10} = 0,02235
w_2 = 0,005826
w_4 = 0,008636
w_8 = 0,01923
x2 = 0,1
x_{10} = 0,18
x_6 = 0,872

No unit problems were detected.

Arrays Table

	w_i	T_i [C]
1	0,01124	31
2	0,005826	46,61
3	0,005826	25
4	0,008636	18
5		
6	0,01854	26
7	0,01923	24,32
8	0,01923	45,41
9	0,01923	75
10	0,02235	59,55

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