



Ζητούται

$$\eta_{\theta} = \frac{[(h_4 - h_6) + (h_7 - h_8) + (h_9 - h_{10})] - (h_{1'} - h_1)}{(h_u - h_{1'}) + (h_7 - h_6) + (h_9 - h_8)}$$

5<sup>η</sup> / 2023

ΥΠΟΛΟΓΙΣΜΟΣ ΚΑΤ/ΡΩΝ ΜΕΓΕΘΩΝ

A. ΥΑΠΕΡΘΕΡΜΟΣ

ΣΗΜ. 4  $p = 100 \text{ bar}$   $h_4 = 3243,35$   
 $t = 450(^{\circ}\text{C}) \rightarrow s_4 = 6,42365$

ΣΗΜ. 7  $p = 15 \text{ bar}$   $h_7 = 3256,6 \text{ kJ/kg}$   
 $t = 400(^{\circ}\text{C}) \rightarrow s_7 = 7,2709 \text{ kJ/kg}\cdot\text{K}$

ΣΗΜ. 9  $p = 1 \text{ bar}$   $h_9 = 3216,5 \text{ (kJ/kg)}$   
 $t = 370(^{\circ}\text{C}) \rightarrow s_9 = 8,45 \text{ kJ/kg}\cdot\text{K}$

B. ΚΟΡΕΣΜΕΝΟ ΕΥΣΤΗΜΑ

<u><math>p = 15 \text{ bar}</math></u>	<u><math>p = 1 \text{ bar}</math></u>	<u><math>p = 0,04 \text{ bar}</math></u>
$t = 198,29(^{\circ}\text{C})$	$99,632(^{\circ}\text{C})$	$28,983(^{\circ}\text{C})$
$v = v' = 0,0011539 \text{ (m}^3/\text{kg)}$	$0,0010434$	$0,0010040$
$v = v' = 0,1517 \text{ (m}^3/\text{kg)}$	$1,694$	$34,80$
$h_f = h_B = 844,67 \text{ kJ/kg}$	$h_A = 417,51$	$h_1 = 121,41$
$h_v = 2789,8 \text{ (kJ/kg)}$	$2675,4$	$2554,6$
$v = 1945,2 \text{ (kJ/kg)}$	$2257,9$	$2433,1$
$s_f = 2,3145 \text{ kJ/kg}\cdot\text{K}$	$1,3027$	$0,4225$
$s_v = 6,4406 \text{ kJ/kg}\cdot\text{K}$	$7,3598$	$8,4755$

$$\begin{aligned}
 h_{f1} &= h_2 + v_1 \cdot (P_2 - P_1) \\
 &= 121,41 + 0,0010040 (100 - 0,04) \times 10^2 \\
 &= 131,445 \text{ (kJ/kg)}
 \end{aligned}$$

ΣHM. 6 :  $h_6 = h_B + r \cdot x_6$  (cond (h-s)  $\rightarrow x_6 \approx 0,995$ )

$$S_4 = S_6 = S_B + \frac{r}{T} \cdot x_6 \rightarrow x_6 = \frac{S_4 - S_B}{r} \cdot T$$

$$x_6 = \frac{6,42365 - 2,3145}{1945,2} \cdot (198,29 + 273,15) = 0,995$$

$$h_6 = 844,67 + 1945,2 \cdot 0,995 = 2780,144 \text{ (kJ/kg)}$$

ΣHM. 8 :  $h_8 = h_A + r \cdot x_8 =$

$$S_7 = S_8 = S_A + \frac{r}{T} \cdot x_8 \Rightarrow x_8 = \frac{S_7 - S_A}{r} \cdot T$$

$$x_8 = \frac{7,2709 - 1,3027}{2257,9} \cdot (99,632 + 273,15) = 0,985$$

$$h_8 = 417,51 + 2257,9 \cdot 0,985 = 2641,541 \text{ (kJ/kg)}$$

ΣHM. 10 :  $h_{10} = h_1 + r \cdot x_{10}$

$$S_9 = S_{10} = S_1 + \left(\frac{r}{T}\right) \cdot x_{10} \Rightarrow x_{10} = \frac{S_9 - S_1}{r} \cdot T$$

$$x_{10} = \frac{8,45 - 0,4225}{2433,1} \cdot (28,983 + 273,15) = 0,996$$

$$h_{10} = 121,41 + 2433,1 \cdot 0,996 = 2544,777 \text{ (kJ/kg)}$$

$$\eta_0 = \frac{[(3243,35 - 2780,144) + (3256,6 - 2641,541) + (3216,5 - 2544,777)] - (131,445 - 121,44)}{(3243,35 - 131,445) + (3256,6 - 2780,144) + (3216,5 - 2641,541)}$$

$$= \frac{(463,206 + 615,059 + 671,723) - (10,035)}{3121,905 + 476,456 + 754,959} = \frac{(\Delta h)_{\text{мабори}}}{(91)_{0,1}}$$

$$= \frac{1749,988 - 10,035}{4353,32} = \frac{1739,953}{4353,32} = 0,399$$