

Zadatok 15.2

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Energetika i dodaci

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$$P = 200 \text{ MWe}$$

$$\eta = 0.44$$

$$m = 0.5$$

$$H = 36 \frac{\text{MJ}}{\text{m}^3} \cdot ?$$

$m(\text{CO}_2)$ godišnje = ?

$$W_{\text{elektr}} = P \cdot m \cdot t_{\text{god}} = P \cdot 365 \cdot 24 \cdot 3600 \text{ s}$$

$$W_{\text{el}} = 200 \text{ MW} \cdot 365 \cdot 24 \cdot 3600 \cdot 0.5$$

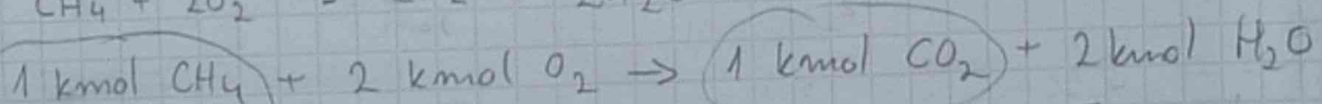
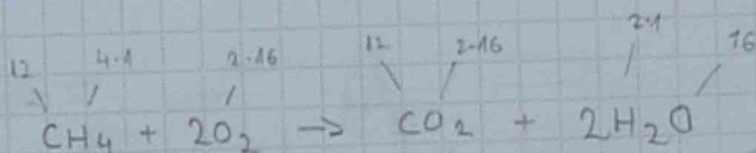
$$W_{\text{el}} = 3153600000 \text{ MJ}$$

$$W_t = \frac{W_e}{\eta} = \frac{3153600000 \text{ MJ}}{0.44} = 7167272727,27 \text{ MJ}$$

$$m \cdot H = E_t \Rightarrow V_{\text{plina}} = \frac{E_t}{H} = \frac{7167272727,27 \text{ MJ}}{36 \frac{\text{MJ}}{\text{m}^3}}$$

Volumen goriva

$$V_{\text{plina}} = 199090909,091 \text{ m}^3$$



TREBA ZAPAMTI!

\Rightarrow 1 kmol plina ima isti volumen pri konst. tlaku i temp.

$$n_{\text{CH}_4} = n_{\text{CO}_2}$$

$$V_{\text{CH}_4} = V_{\text{CO}_2}$$

$$\left\{ \begin{array}{l} n = \frac{V}{V_n} \\ n = \frac{m}{M} \end{array} \right.$$

$$\frac{V}{V_n} = \frac{m}{M} \Rightarrow V = \frac{m}{M} \cdot V_n$$

$$V(\text{CH}_4) = V(\text{CO}_2)$$

$$\frac{m(\text{CH}_4)}{M(\text{CH}_4)} \cdot V_n = \frac{m(\text{CO}_2)}{M(\text{CO}_2)} \cdot V_n$$



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12 + 2 · 16

$$M_{(CO_2)} = \frac{M(CO_2)}{M(CH_4)} \cdot M(CH_4) = \frac{44 \frac{kg}{kmol}}{16 \frac{kg}{kmol}} \cdot 142207792 kg$$

$$n_{CH_4} = \frac{V_{(CH_4)}}{V_n} = \frac{199090909.091 m^3}{22.4 \frac{m^3}{kmol}} = 8887987 kmol$$

$$V_n = 22.4 \frac{dm^3}{mol} = 22.4 \cdot \frac{0.1^3}{0.001} \left[\frac{m^3}{kmol} \right] = 22.4 \frac{m^3}{kmol}$$

$$M(CH_4) = n \cdot M(CH_4) = 8887987 kmol \cdot 16 \frac{kg}{kmol}$$

12 + 4 · 1 = 16 $\frac{kg}{kmol}$

$$M(CH_4) = 142207792 kg$$

$$\rightarrow M(CO_2) = 391071428 kg = \underline{\underline{391071 t}}$$

