Question: Find the weight of the products of combustion of 8 kg of light...

Find the weight of the products of combustion of 8 kg of light kerosene(C10H22), with 45% excess air. Determine the: a) Air-to-fuel ratio by mass (Actual). b) Weight of the products of combustion. c) Volumetric Analysis of the products of combustion

Expert Answer

Anonymous answered this
225 answers

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(1) air contains 79% N_2 & 21% O_2 by vol.

(2) air contains 77% N_2 & 23% O_2 by mass

⇒ By mass Analysis

a) Perfect stiochiometry

$$C_{10}H_{22} + 15.5\left(O_2 + \frac{77}{23}N_2\right) \longrightarrow$$

$$11H_2O + 10CO_2 + 15.5 \times \frac{77}{23}N_2$$

b). In 45% excess air, O_2 will be formed

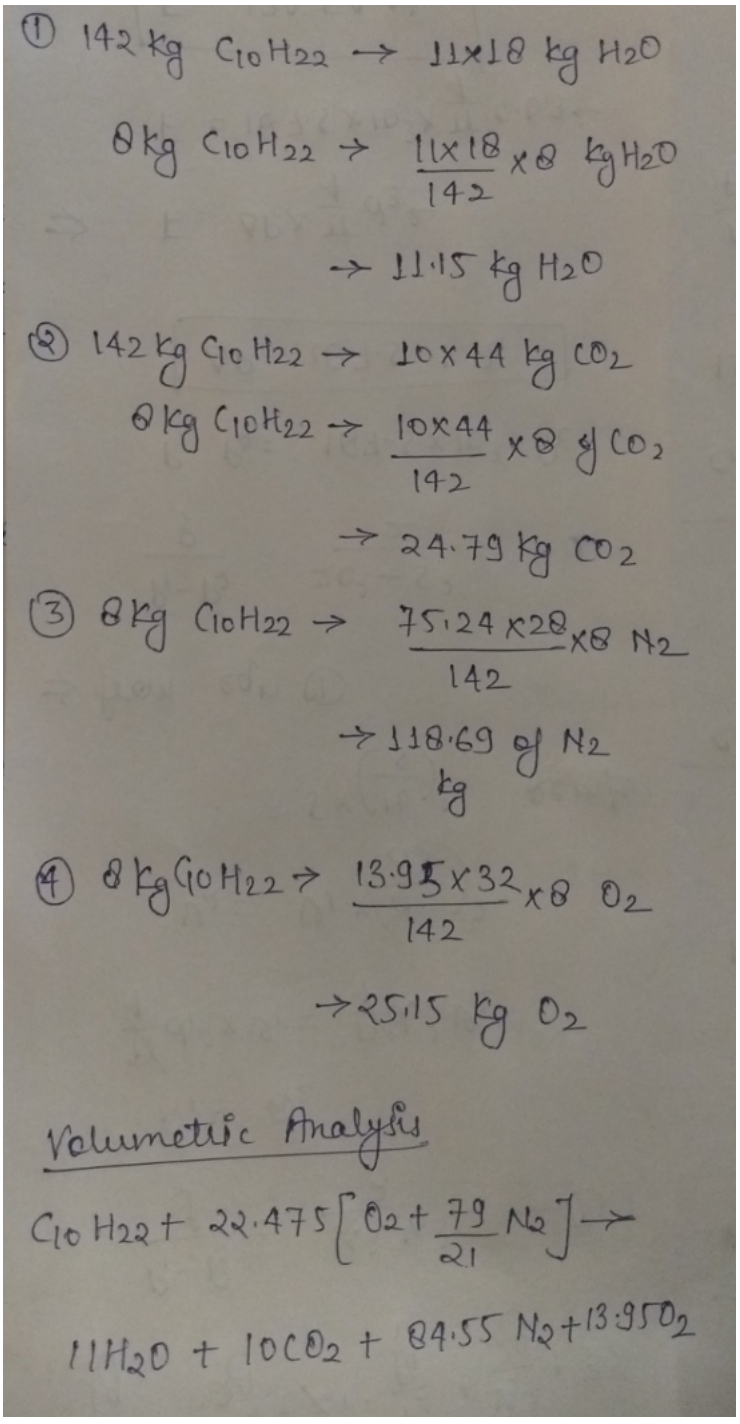
$$15.5 \times 1.45 = 22.475$$

$$C_{10}H_{22} + 22.475\left(O_2 + \frac{77}{23}N_2\right) \longrightarrow$$

$$11H_2O + 10CO_2 + 75.24N_2 + 13.95O_2$$

$$\frac{A}{F} = \frac{22.475\left[32 + \frac{77}{23} \times 28\right]}{10 \times 12 + 22}$$

$$\boxed{\frac{A}{F} = 19.9}$$



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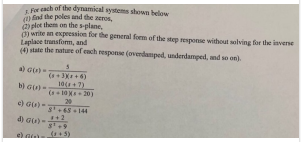
shown below (a) find the poles and



See answer

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