Stoichiometric Ratio MOLES 2

Objective: Be able to set up an ISE table and utilize the stoichiometric ratio.

For each of the following questions, calculate the ? unknown quantity.

$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

I 15moles

S ? ? ?

E

$\frac{15}{1} \left| \frac{2\ O_2}{} \right. = 30$ $\qquad$ $\frac{15}{1} \left| \frac{1\ CO_2}{} \right. = 15\ CO_2$

$\frac{15}{1} \left| \frac{2\ H_2O}{} \right. = 30\ H_2O$

$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

I 10 mol

S ? ? ?

E

$\frac{10}{2} \left| \frac{1\ CH_4}{} \right. = 5$ $\qquad$ $\frac{10}{2} \left| \frac{1\ CO_2}{} \right. = 5\ CO_2$

LR

$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

I 10mol 10 mol

S ?

E 20

$\frac{10}{1\ O_2} \left| \frac{2\ H_2O}{} \right. = 20\ H_2O$

makes less

Thought question here, using the top two questions how much water do you think you will get?

$2CH_3OH + 3O_2 \rightarrow 2CO_2 + 4H_2O$

I 6mol

S ? ? ?

E

$\frac{6}{2} \left| \frac{3\ O_2}{} \right. = 9\ O_2$ $\qquad$ $\frac{6}{2} \left| \frac{4\ H_2O}{} \right. = 12\ H_2O$

$\frac{6}{2} \left| \frac{2}{} \right. = 6\ CO_2$

$2CH_3OH + 3O_2 \rightarrow 2CO_2 + 4H_2O$

I 6mol

S ? ? ?

E

$\frac{6}{3} \left| \frac{2\ CH_3OH}{} \right. = 4$ $\qquad$ $\frac{6}{3} \left| \frac{2}{} \right. = 4\ CO_2$

$2CH_3OH + 3O_2 \rightarrow 2CO_2 + 4H_2O$

I 6mol 6mol

S ?

E

$\frac{6}{3} \left| \frac{4}{} \right. = 8\ H_2O$

Thought question here, using the top two question:

$10 \mid 5 \over 2$ = ~~hint~~ 25_{O_2} $\quad$ $10 \mid 8 \over 2$ = 40 CO_2

$2C_4H_{10} + 5O_2 \rightarrow 8CO_2 + 10H_2O$

I 10mol

S ? ? ?

E

$10 \mid 10 \over 2$ = 50 H_2O

$2C_4H_{10} + 5O_2 \rightarrow 8CO_2 + 10H_2O$

I 20mol

S ? ?

E

$20 \mid 2\ C_4H_{10} \over 5$ = 8 C_4H_{10} $\quad$ $20 \mid 8\ CO_2 \over 2$ = 80 CO_2

$2C_4H_{10} + 5O_2 \rightarrow 8CO_2 + 10H_2O$

I 10mol 20mol

S ? 40 mole H_2O

E

$20\ O_2 \mid 10\ H_2O \over 5O_2$ = 40 H_2O

How many water molecules can be made in this process above?

Solve the following using factor label. Use moles for the following!

$2C_6H_6 + 15O_2 \rightarrow 12CO_2 + 6H_2O$

I 50mol

S ?

E

$2C_6H_6 + 15O_2 \rightarrow 12CO_2 + 6H_2O$

I 150

S ?

E

$150 \mid 2 \over 15$ = 20 C_6H_6

$2C_6H_6 + 15O_2 \rightarrow 12CO_2 + 6H_2O$

I 50 150

S 20 -150 ?

E 20 0

$50 \mid 15 \over 2$ = 375 O_2

$150 \mid 6\ H_2O \over 15$ = 60 H_2O