

5.23g glucose = _____ atoms Oxygen.

① $C_6H_{12}O_6$

③ #, unit, substance

MOLE RATIO

5.23g $C_6H_{12}O_6$	1 mole $C_6H_{12}O_6$	6 moles O	6×10^{23} atoms O
	180g $C_6H_{12}O_6$	1 moles glucose	1 mole O

= 1.046×10^{23} atoms O

Sep 20-7:40 AM

$2 H_2(g) + O_2(g) \rightarrow 2 H_2O(g)$

If we have 5L of $O_2(g)$, how many grams of $H_2(g)$ are needed for all 5L to react?

5L O_2	1 mole O_2	2 moles H_2	2 H_2	= 0.593g H_2
	22.4L	1 mole O_2	1 mole H_2	

Sep 20-8:05 AM

1:2:1 Empirical Analysis

CH_2O (circled)

$\text{C}_6\text{H}_{12}\text{O}_6$ (circled)

Empirical formula → "Simplified"
Lowest ratio

Molecular formula → Not simplified
Tells exact # present.

ORGANIC #C

~~C_3H_6 molec.
 $\text{CH}_2 \rightarrow \text{emp}$~~

Sep 20-8:11 AM

Emp Analysis $\text{C}_x\text{H}_y\text{O}_z$ $\text{C}_3\text{H}_4\text{O}_3$ (circled)

40.92% C, 4.58% H, 54.50% O

Divide by smallest #

C $\frac{40.92\text{g C}}{12\text{g C}} = 3.41 \text{ mole C} = \frac{3.41}{3.41} = 1 \times 3 = 3$

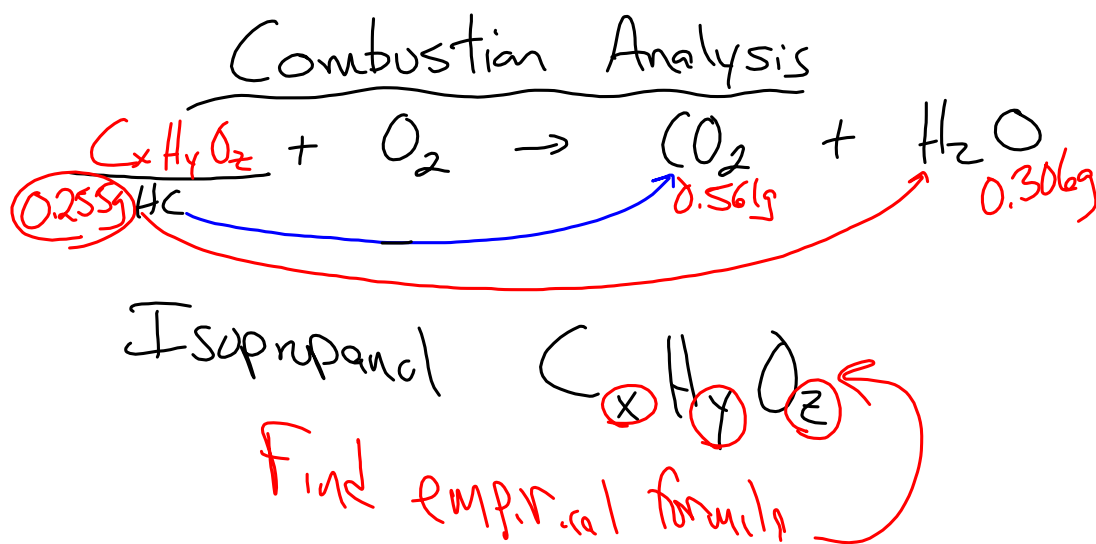
H $\frac{4.58\text{g H}}{1\text{g H}} = 4.58 \text{ mole H} = \frac{4.58}{3.41} = 1.34 \times 3 = 4$

O $\frac{54.50\text{g O}}{16\text{g O}} = 3.41 \text{ mole O} = \frac{3.41}{3.41} = 1 \times 3 = 3$

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Last Step
 0.33 or 0.66 ($\times 3$)
 0.5 ($\times 2$)
 0.25 or 0.75 ($\times 4$)

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$C_xH_yO_z + O_2 \rightarrow CO_2 + H_2O$
0.255g 0.56g 0.306g. "x"

① Find moles C 0.01275 mole C

0.56g CO ₂	1 mole CO ₂	1 mole C	12g C	= 0.153g C
44g CO ₂	1 mole CO ₂	1 mole C	1 mole C	

② Find moles H 0.034 mole H "y"

0.306g H ₂ O	1 mole H ₂ O	2 mole H	1g H	= 0.034g H
18g H ₂ O	1 mole H ₂ O	1 mole H ₂ O	1 mole H	

$C_xH_yO_z - (H) - (C) = g O$
 0.255g - (0.034g - 0.153g) = 0.068g O

0.068g O	1 mole O	16g O	= 0.00425 mole O "z"
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C 0.01275	H 0.034	O 0.00425
0.00425	0.00425	0.00425
3	8	1

(Empirical)

$3 H_8 O$

= $C_3 H_8 O$

Sep 20-8:54 AM

Limiting Reagent (Reactant)

$$\begin{array}{ccc}
 2\text{H}_2 & + & \text{O}_2 & \rightarrow & 2\text{H}_2\text{O} \\
 4\text{g} & & 5\text{g} & & \text{? g}
 \end{array}$$

L.R.
5 Frames + 40 Frames \rightarrow 95
5 Frames \rightarrow 5 Frames

Sep 20-8:59 AM

$$\begin{array}{ccc}
 2\text{H}_2 & + & \text{O}_2 & \rightarrow & 2\text{H}_2\text{O} \\
 4\text{g} & & 5\text{g} & & \text{? g}
 \end{array}$$

\rightarrow 5.625g

4g H ₂	Mole H ₂	2 mole H ₂ O	18g H ₂ O	= 36g H₂O
2g H₂	1 mole H₂	2 mole H₂	18g H₂O	

5g O ₂	Mole O ₂	2 mole H ₂ O	18g H ₂ O	= 5.625g H₂O
32g O₂	1 mole O₂	2 mole H₂	18g H₂O	

5g O₂	1 mole O₂	2 mole H ₂	2g H ₂	= 0.625g H₂ used
32g O₂	1 mole O₂	1 mole O₂	1 mole H ₂	

4 have - 0.625 used = 3.375 (left over)

Sep 20-9:02 AM