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COMPLETE

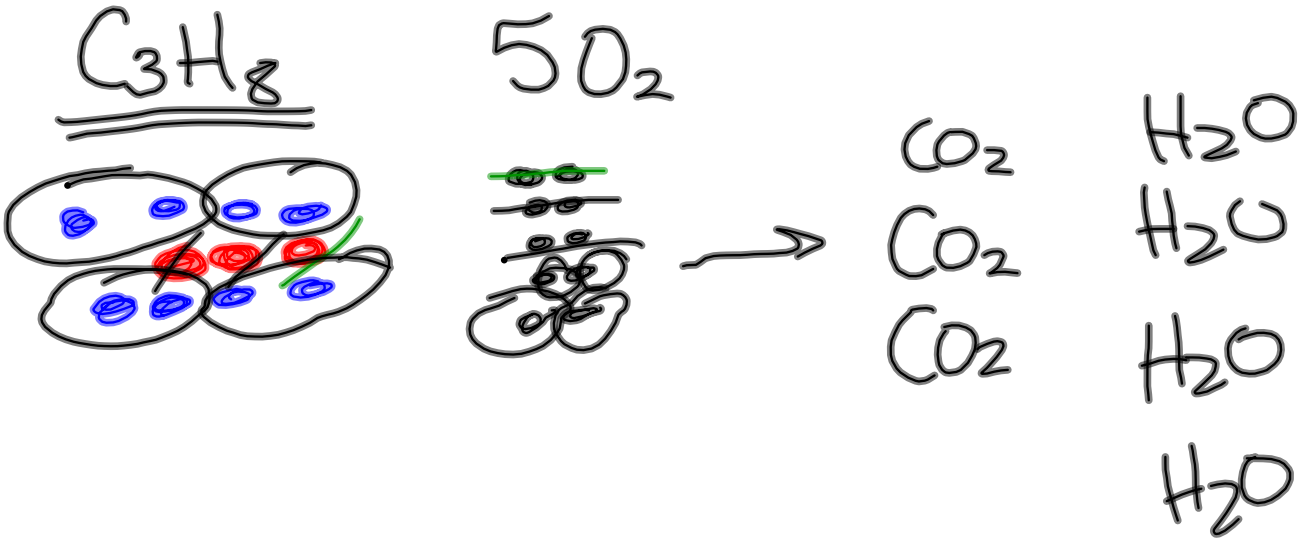
propane + oxygen → carbon dioxide + water vapour

$$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$$

INCOMPLETE

propane + oxygen → carbon dioxide + carbon monoxide + carbon + water vapour

$$2C_3H_8 + 7O_2 \rightarrow 2CO_2 + 4CO + C + 8H_2O$$


C3H8
5O2
CO2
CO2
CO2
H2O
H2O
H2O
H2O

$2\,NH_3 \longrightarrow N_2 + 3\,H_2$

$2\,NaCl + CaSO_4 \longrightarrow Na_2SO_4 + CaCl_2$

$Fe(OH)_2 + 2\,Ag \longrightarrow Fe + 2\,AgOH$

$C_5H_2 + 8\,O_2 \longrightarrow 5\,CO_2 + 6\,H_2O$

16 | 10 6 16

CO_2

CO_2

CO_2

CO_2

CO_2

$2\,NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2\,H_2O$ (HOH)

$2\,AlCl_3 \rightarrow 2\,Al + 3\,Cl_2$

$BCl_3 + 3\,H_2O \rightarrow B(OH)_3 + 3\,HCl$ (HOH)

$XeF_6 + 3\,H_2O \rightarrow XeO_3 + 6\,HF$

$C_4H_8 + 6\,O_2 \rightarrow 4\,CO_2 + 4\,H_2O$

$C_6H_{12}O_6 \rightarrow 6\,C + 6\,H_2 + 3\,O_2$

$Al_2O_3 + 3\,H_2SO_4 \rightarrow Al_2(SO_4)_3 + 3\,H_2O$

Types of Chemical Reactions

II. Synthesis (Combination) Reactions

The reactions of smaller atoms/molecules into larger molecules

$$A + B \Rightarrow AB$$

Ex. hydrogen + oxygen $\Rightarrow$ water

$$2H_2 + O_2 \rightarrow 2H_2O$$

$Na^+ Cl^-$

Ex. $2Na + Cl_2 \Rightarrow 2NaCl$

COMBUSTION

_____ + oxygen →

_____ + O_2 →

"burned"

Types of Chemical Reactions

III. Decomposition Reactions

Decomposition reactions typically involve splitting a larger molecule into elements or smaller molecules.

$$AB \Rightarrow A + B$$

Ex. nitrogen triiodide $\Rightarrow$ nitrogen + iodine

$$2NI_3 \longrightarrow N_2 + 3I_2$$

$Na^+ Na^+ Na^+ \quad N^{3-}$

sodium + nitrogen ⟶ sodium nitride

$6\,Na + 1\,N_2 \longrightarrow 2\,Na_3N$

aluminum chloride ⟶ aluminum + chlorine

sugar ⟶ carbon + hydrogen + oxygen

iron + fluorine ⟶ iron (III) fluoride

iron