Balancing Equations

 $10 \mathrm{SCIE}$ - Fire & Fuels

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Learning Outcomes

- 8. Write the word equation for complete combustion
- 9. Write the balanced symbol equation for complete combustion

Starter

- 1. What are some key observations that would indicate incomplete combustion?
- 2. What are some key observations that would indicate complete combustion?

Keywords

- Reactants: Butane, oxygen, hydrogen, vinegar etc.
- Products: Carbon dioxide, water, carbon etc.
- Chemical Compound: H_2O , CO_2 , NH_3 , NaCl etc.
- Atom/Molecule: H, C, O, Au, Ca

Question

What happens to the atoms/molecules during a chemical reaction?

- No new atoms are created or destroyed
- Mass of the reactants = mass of the products
- The reactants change molecular structure
- Two or more new products are made
- ullet The atoms are rearranged

Complete Combustion of Methane

Complete the word and balanced symbol equation for this reaction.

$$methane + oxygen \rightarrow + CH_4 + O_2 \rightarrow +$$

Answer Complete combustion of methane:

$$methane + oxygen \rightarrow \text{carbon dioxide} + water$$

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

Burning of Magnesium

Complete the word and balanced symbol equation for this reaction.

$$magnesium + oxygen \rightarrow Mg + O_2 \rightarrow$$

Answer Burning of Magnesium

$$\begin{array}{cccc} magnesium & + & oxygen \rightarrow & \text{magnesium oxide} \\ 2Mg & + & O_2 \rightarrow & 2MgO \end{array}$$

Balance these reactions:

$$\begin{array}{ccccc} C & + & O_2 \rightarrow & CO_2 \\ H_2 & + & O_2 \rightarrow & H_2O \\ N_2 & + & H_2 \rightarrow & NH_3 \\ CH_4 & + & O_2 \rightarrow & CO_2 + & H_2O \end{array}$$

Answer

Extra Work

- 1. Page 9: Fuels & Combustion
- 2. Balancing Equations Worksheet