

Combustion

KS3 Chemistry · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Write the word equation for methane (natural gas) burning completely.

Step 1 · Reactants

methane + oxygen

Step 2 · Products of complete combustion of a hydrocarbon

carbon dioxide + water

Answer: methane + oxygen → carbon dioxide + water

Check: Methane contains only carbon and hydrogen, so the products are their oxides.

2. Now try one with the steps

A candle burns under an upturned jar and goes out after a few seconds. Explain.

Step 1 · What does burning need?

Step 2 · What happens in the jar?

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. What is combustion? [1]

2. Name the three things in the fire triangle. [1]

3. Is combustion exothermic or endothermic? [1]

4. Name the two products when methane burns completely. [2]

5. What is the test for carbon dioxide? [1]

6. How does a fire blanket put out a fire? [1]

7. Why should you never throw water on a burning chip pan? [2]

8. What colour is a Bunsen flame with the air hole closed? [1]

9. Name TWO products of incomplete combustion. [2]

10. Why is carbon monoxide so dangerous? [2]

11. Write the word equation for carbon (charcoal) burning completely. [1]

12. Hydrogen burns to make only water. Why is it called a 'clean' fuel? [1]

13. Balance: $\text{CH}_4 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$. Write the balanced equation. [2]

14. Two fuels are tested by heating 100 g of water. Fuel A raises the temperature by 20 °C; fuel B by 35 °C, burning the same mass. Which fuel releases more energy per gram? [1]

4. Before you hand it in

"Burning destroys the fuel."

The fuel's atoms combine with oxygen to make new substances, mostly gases that escape.

"Smoke is carbon dioxide."

Visible smoke is mostly soot (carbon particles) and droplets from incomplete combustion.

Forgetting oxygen reactant.

Always write 'fuel + oxygen →' in combustion equations.

Thinking the yellow flame is hotter because it is brighter.

The blue flame (complete combustion) is much hotter.