Crude Oil Hydrocarbons

GCSE Chemistry · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

An alkane has 5 carbon atoms. Use the general formula to work out its formula and name it. (2 marks)

Step 1 · General formula C_nH_{2n+2}

$n = 5$: $H = 2 \times 5 + 2 = 12$

Step 2 · Formula and name

C_5H_{12}, pentane

Answer: C_5H_{12}, pentane

Check: 'Pent' means five.

2. Now try one with the steps

Describe how crude oil is separated by fractional distillation. (4 marks)

Step 1 · Heat

Step 2 · Column

Step 3 · Condense

Step 4 · Order

Answer:

3. Practice

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

1. Define the term hydrocarbon. [1]

2. Give the general formula of the alkanes. [1]

3. Write the formula of the alkane with 6 carbon atoms. [1]

4. Name the alkane with formula C_3H_8. [1]

5. Explain why crude oil is described finite resource. [1]

6. Describe how the boiling point of alkanes changes chain length increases. [1]

7. Describe how viscosity and flammability change chain length of alkanes increases. [2]

8. Describe how crude oil is separated by fractional distillation. [4]

9. Name two fractions from crude oil and give one use of each. [2]

10. Calculate the relative formula mass of butane, C_4H_{10}. (C = 12, H = 1) [1]

11. Write a balanced symbol equation for the complete combustion of propane. [2]

12. Explain why short-chain hydrocarbons make better fuels than long-chain ones. [2]

13. Balance the equation for the complete combustion of octane: $C_8H_{18} + O_2 \rightarrow CO_2 + H_2O$ [2]

14. Calculate the mass, in g, of carbon dioxide produced when 16 g of methane burns completely. $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ (C = 12, H = 1, O = 16) [3]

4. Before you hand it in

"Crude oil is a compound."
Crude oil is a MIXTURE, which is why physical separation (fractional distillation) works.

"Long-chain fractions condense at the top."
Long chains condense near the hot bottom; short chains rise to the cooler top.

Writing C_3H_6 for propane
Alkanes follow C_nH_{2n+2}: propane is C_3H_8.