Crude oil and hydrocarbons

AQA GCSE Chemistry (8462) · Foundation and Higher

Answer on your own paper. Show your working where needed.

1. What counts as a hydrocarbon

Which of these formulae represent hydrocarbons? CH_4, CH_3OH, C_3H_8, CO_2. Explain how you decided.

2. The next member of a series

Write the general formula of the alkanes. Use it to find the molecular formula of an alkane with five carbon atoms. Explain what makes it saturated.

3. Separated fractions

In a fractionating column, one fraction is collected near the cool top and another much lower down. Compare the typical chain lengths and boiling points of their molecules.

4. Propane in excess oxygen

Propane has the molecular formula C_3H_8. Write a balanced symbol equation for its complete combustion in oxygen.

5. Faulty fuel burning

A gas flame leaves black deposits on a pan. State the substance in the deposit and explain what a limited oxygen supply can do to the products of combustion.

6. A refinery reaction

A refinery cracks one molecule of a hydrocarbon with formula $C_{12}H_{26}$ to form one molecule of C_8H_{18} and one other molecule. Work out the other formula. Explain how cracking can meet the demand for two different kinds of product.

7. Interpreting a colour change

Bromine water stays orange with sample A and becomes colourless with sample B. The samples are ethane and ethene. Identify both. Draw the product of B reacting with bromine, showing all its bonds.

8. A surplus of heavy fractions

A refinery has surplus long-chain hydrocarbons and needs more petrol-range fuel and more feedstock for making polymers. An operator proposes distilling the surplus a second time. Explain why that will not achieve both aims. Suggest a process that could.

9. Extra challenge · Follow the cracking products

A refinery cracks one molecule of $C_{14}H_{30}$ into one molecule of C_9H_{20} and one other molecule. Both products have open chains. Work out the other formula and predict what the substance would do to bromine water. Give the general conditions for steam cracking and explain why fractional distillation alone cannot supply this product.

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