2.24 Alkanes, Alkenes and Crude Oil: 10-minute Pack

AQA 8464 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Crude oil is a mixture of hydrocarbons found trapped in porous rocks. It is a finite resource.

(a) Define the term 'hydrocarbon'. **(1)**

(b) State what is meant by describing crude oil as a 'finite resource'. **(1)**

(Total for Question 1 is 2 marks)

2 Name and formula questions.

(a) Write down the name of the alkane with the molecular formula C_4H_{10}. **(1)**

(b) Write down the empirical formula of ethene, C_2H_4. **(1)**

(Total for Question 2 is 2 marks)

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3 Properties of hydrocarbons depend on chain length.

(a) State one physical property that changes when hydrocarbon chain length increases in the fractionation of crude oil. **(1)**

(b) State another property that changes as chain length increases. **(1)**

(Total for Question 3 is 2 marks)

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4 A sample of petrol is analysed by fractional distillation. The petrol fraction boils between 40°C and 200°C.

(a) Explain why molecules in the petrol fraction stay as a liquid at room temperature but separate from heavier fractions in the column. **(3)**

(Total for Question 4 is 3 marks)

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Mark scheme · 2.24 Alkanes, Alkenes and Crude Oil: 10-minute Pack

Question 1

(a) a compound (molecule) containing only carbon and hydrogen atoms, oe **B1**

(a) Answer: A compound containing only carbon and hydrogen atoms.

(b) a resource that is being used up faster than it can be formed/replaced, so it will eventually run out, oe **B1**

(b) Answer: A resource that is being used up faster than it forms, so it will eventually run out.

Question 2

(a) butane cao (accept isobutane or methylpropane as the same isomer name) **B1**

(a) Answer: Butane

(b) CH_2 cao **B1**

(b) Answer: CH_2

Question 3

(a) boiling point increases cao **B1**

(a) Answer: Boiling point increases

(b) viscosity increases or volatility decreases or flammability decreases, oe **B1**

(b) Answer: Viscosity increases

Question 4

(a) states that petrol molecules have intermediate intermolecular forces compared with lighter and heavier fractions, oe **M1**

(a) explains that at room temperature these forces are strong enough to keep molecules liquid, but weaker than heavier fractions so petrol rises further up and condenses higher in the column, oe **A1**

(a) links boiling point range to where fraction condenses in the column, oe **A1**

(a) Answer: Petrol molecules have intermediate intermolecular forces; these are strong enough for them to be liquid at room temperature but weaker than heavier fractions so they rise further up and condense higher in the column; the boiling point range means they separate from heavier fractions.

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