

Section A

1. Describe what happens when large hydrocarbon molecules are cracked.

2. Choose which of these is an alkene.

Tick (✓) **one** box.

A. Ethane

☐

B. Ethene

☐

C. Propane

☐

3. Give one difference between alkanes and alkenes.

4. What type of reaction is cracking?

Tick (✓) **one** box.

A. Combustion

☐

B. Neutralisation

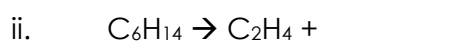
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C. Decomposition

☐

5. The chemical equations below show some of the reactants and products of different cracking reactions.

a. Determine the formula of the missing product in each case.



b. Highlight all alkanes in one colour and all alkenes in another colour.

Section B

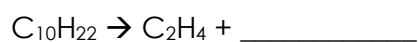


6. Crude oil is fractionally distilled. Fractions with larger molecules can then be cracked.

Describe two differences between fractional distillation and cracking.

7. Decane ($C_{10}H_{22}$) is commonly cracked.

- a. Determine the formula of the other product formed when decane is cracked.



- b. Name the product with the formula C_2H_4 .

- c. C_2H_4 is an alkene. Explain how this could be tested.

- d. Give two conditions used for cracking decane.

8. The table below gives some information about fractions of crude oil.

Fraction	Approximate % of crude oil	Approximate % of total demand
LPG	4	6
Petrol	10	25
Kerosene	16	14
Diesel	20	20
Heavy fuel oil		18
	28	17

- a. What does LPG stand for?

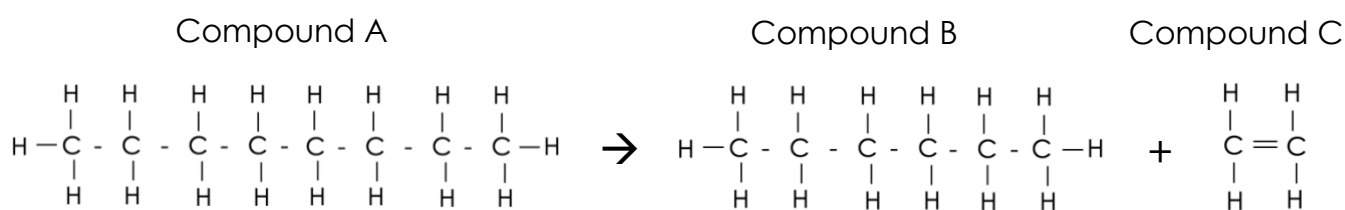


b. Complete the table by naming the missing fraction and calculating the approximate percentage of crude oil that is made up of heavy fuel oil.

c. Identify which of these fractions is the most flammable.

d. Use the information in the table to explain why it is useful to crack hydrocarbons.

9. The diagram below shows a chemical reaction.



a. Compounds A, B and C are all what type of compound?

b. What type of chemical reaction is shown by this diagram?

c. Suggest one use for Compound B.

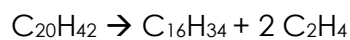
d. Suggest one use for Compound C.

Section C

10. Cracking is used to break long hydrocarbon chains into smaller hydrocarbon chains.



- a. Cracking takes place under high temperatures. Explain whether cracking is an exothermic or endothermic reaction.
- b. (HT) $C_{20}H_{42}$ can be cracked. The equation for the reaction is:



Calculate the mass of $C_{20}H_{42}$ needed to produce 40 kg of ethene.

Relative atomic masses:

C=12

H=1

