Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: Alkanes

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Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Mark Schemes

Q1.

(a) **M1** $\frac{137.5}{492.6}$ or

$\frac{12.0 + 3(35.5) + 19.0}{121.8 + 3(19.0) + 2(79.9) + 12.0 + 4(35.5)}$ or $\frac{137.5}{338.6 + 154.0}$

$\frac{12.0 + 3(35.5) + 19.0}{12.0 + 3(35.5) + 19.0 + 121.8 + 2(19.0) + 2(79.9) + 35.5}$ or $\frac{137.5}{355.1 + 137.5}$

1

M2 (× 100) = 27.9 (%)

1

***M2** must be 3 sig figs*
Correct answer scores 2 marks
Can score 1 mark for 137.5 (or working that gives this) or 492.6 (or working that gives this) in working if no other marks scored

(b) **M1** $CHCl_2F + {\bullet}Cl \rightarrow {\bullet}CCl_2F + HCl$

1

M2 ${\bullet}CCl_2F + Cl_2 \rightarrow CCl_3F + {\bullet}Cl$

1

Allow equations in either order
Allow dot anywhere on the correct radical
Ignore extra initiation and termination steps
Penalise absence of dots once only

(c) $2\ {\bullet}CCl_2F \rightarrow CCl_2FCCl_2F$

Allow dot anywhere on the radical
Structural formula of product must be shown in answer (ignore additional correct molecular formula)

1

[5]

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Q2.

(a) **Step 1**

M1 fractional distillation

1

M2 separated into mixtures of compounds with similar boiling points / similar sized molecules

***M2** to separate naphtha from other compounds; to separate compounds by chain length / size / boiling point*

1

Step 2

M3 (thermal) cracking

***M3** not catalytic cracking*

1

M4 to make alkenes / propene ***/*** shorter molecules

1

Step 3

M5 (addition) polymerisation

***M5** not condensation polymerisation 1*

1

M6 molecules joined together or to produce long chain molecule

For each step the two marks are independent

1

(b) no polar bonds (in chain) / non-polar

Do not allow if only C-H bonds mentioned as non polar

1

(c) to prevent build-up of waste (in landfill) OR they can be broken down by natural processes

1

[8]

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Q3.

(a) Absorbs/prevents harmful uv

Allow reduced risk of skin cancer from uv

1

(b) C-Cl bonds broken (homolytically)

Could show in an equation showing the bond

1

(c) $Cl\bullet + O_3 \rightarrow ClO\bullet + O_2$

M1

$ClO\bullet + O_3 \rightarrow Cl\bullet + 2O_2$

M2

(d) $Cl\bullet + CH_2F_2 \rightarrow$

Penalise missing dot once only

M1

$\rightarrow CHClF_2 + Cl\bullet$

M2

Propagation

M3

[7]

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