Name of the Student:_____
Max. Marks : 27 Marks **Time : 27 Minutes**

Mark Schemes

Q1.

(a) (i) (free–)radical substitution
(both words required for the mark)
1

(ii) uv light OR sunlight OR high temperature OR 150 °C to 500 °C
1

(iii) Propagation
(ignore "chain", "first", "second" in front of the word propagation)
1

(iv) Termination
1

$\bullet CH_2CH_3 + Br\bullet \longrightarrow CH_3CH_2Br$
OR $2\bullet CH_2CH_3 \longrightarrow C_4H_{10}$
(penalise if radical dot is obviously on CH_3, but not otherwise)
(penalise $C_2H_5\bullet$)
(credit $2Br\bullet \longrightarrow Br_2$)
(ignore "chain" in front of the word termination)
1

(b) (i) Fractional distillation OR fractionation
(credit gas–liquid chromatography, GLC)
1

(ii) $CH_3CH_3 + 6Br_2 \longrightarrow C_2Br_6 + 6HBr$
(credit C_2H_6 for ethane)
1

(c) Correct structure for CF_2BrCF_2Br drawn out
(penalise "Fl" for fluorine)
1

(d) (i) 2–bromo–2–chloro–1,1,1–trifluoroethane
OR 1–bromo–1–chloro–2,2,2–trifluoroethane
(insist on all numbers, but do not penalise failure to use alphabet)
(accept "flourine" and "cloro" in this instance)
1

(ii) 197.4 only
(ignore units)
1

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(iii) (57/197.4 × 100) = 28.9% OR 28.88%

(credit the correct answer independently in part (d)(iii), even if (d)(ii) is blank or incorrectly calculated, but mark consequential on part (d)(ii), if part (d)(ii) is incorrectly calculated, accepting answers to 3sf or 4sf only)

(penalise 29% if it appears alone, but not if it follows a correct answer)

(do not insist on the % sign being given)

(the percentage sign is not essential here, but penalise the use of units e.g. grams)

1

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Q2.

(a) **X** (O–H) <u>(alcohols)</u>

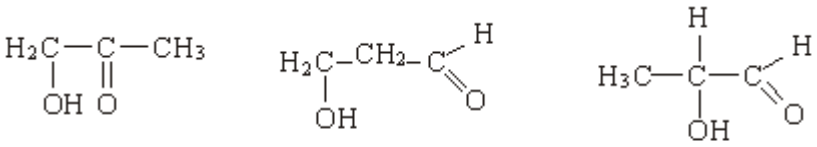
penalise acid or missing "alcohol"

1

Y C=O

allow carbonyl

1

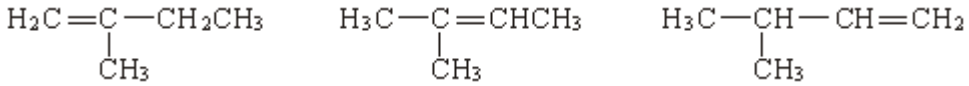


A

NOT acid

4

(b)

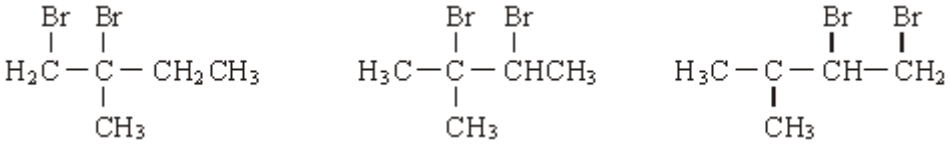


Allow conseq dibromocompounds following incorrect unbranched alkenes

NOT allow dibromocompound consequent on a duplicate alkene

NOT allow monobromocompounds if HBr added

3



3

6:3:1 either next to correct structure or to none

1

Allow a mark for identifying correct dibromocompound with three peaks even if integration ratio is wrong

1

if 6:3:1 missing or wrong, no marks for splitting

Only award a mark for splitting if it is clear which integration number it refers to

6 singlet or drawn

1

3 doublet or drawn

1

1 quartet/quadruplet or drawn

1

(max 10 marks)

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