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

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Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes

Q1.

(a) A group of (hydrocarbons/compounds) with similar boiling points

Allow compounds that boil in a similar range of temperatures

Compounds with similar (carbon) chain length with C5-C12 range or within range

1

(b) zeolite

Allow Aluminosilicate or aluminium oxide

M1

All formulae correct

M2

Balanced equation $C_{16}H_{34} \rightarrow C_6H_{14} + 2\ C_5H_{10}$

M3

(c) C=O bonds vibrate at the same frequency as IR

The difference in energy between the ground and first excited vibrational state of CO_2 is equal to the energy of the infrared radiation.

Allow

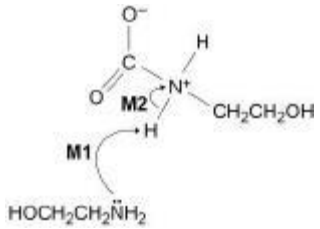
Bond vibrations match frequency of IR radiation

C=O bonds vibrate in range 1680-1750cm^{-1}

C=O bonds are polar

1

(d)



Curly arrow from N lp to H

Curly arrow from N-H bond to N$^+$

M1
M2

2-aminoethanol

Allow 2-hydroxyethylamine 2-hydroxyethanamine ethanolamine

M3

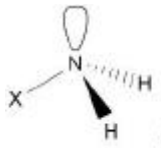
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Base

Allow proton acceptor / removes H^+ / electron pair donor M1

M4

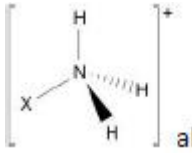
(e)



allow with/without lone pair

Allow these shapes with lines instead of wedges and dashed lines

M1



allow with/without charge

M2

Smaller

Allow comparison of correct numbers

M3

lone (or non-bonding) pair repulsion greater than bond pair repulsion

M4

(f)

This question is marked using Levels of Response. Refer to the Mark Scheme Instructions for Examiners for guidance.	
Level 3 **5-6 marks**	All stages are covered and each stage is generally correct and virtually complete. Answer is communicated coherently and shows a logical progression from Stage 1 to Stages 2 and 3 Covers at least 2 points for stage 1, 2 for stage 2 and 3 for stage 3.
Level 2 **3-4 marks**	All stages are covered but stage(s) may be incomplete or may contain inaccuracies **OR** two stages are covered and are generally correct and virtually complete. Answer is communicated mainly coherently and shows a logical progression from Stage 1 to Stages 2 and 3. Covers at least 1 point for stage 1 to stages 2 and 3.
Level 1 **1-2 marks**	Two stages are covered but stage(s) may be incomplete or may contain inaccuracies **OR** only one stage is covered but is generally correct and virtually complete. Answer includes isolated statements but these are not presented in a logical order.
Level 0	Insufficient correct chemistry to gain a mark

Indicative Chemistry content

Stage 1 names of processes

1a Photosynthesis (is the natural process in plants that takes CO_2 from the air)

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1b Fermentation (is the process used to make bioethanol releasing some CO_2)

1c Combustion (is the process where bioethanol is burned and releases CO_2)

Stage 2 Equations

2a $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

2b $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$

2c $2C_2H_5OH + 6O_2 \rightarrow 6H_2O + 4CO_2$

Stage 3 Carbon neutrality and environmental issues

3a Deforestation / Sacrifice land that could be used for food

3b Loss of biodiversity / habitat

3c $6CO_2$ in and $6CO_2$ out but it isn't actually C neutral as fuel is used in production, distribution, etc

6

[19]

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