Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: Aldehydes & ketones

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Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks :15 Marks **Time :15 Minutes**

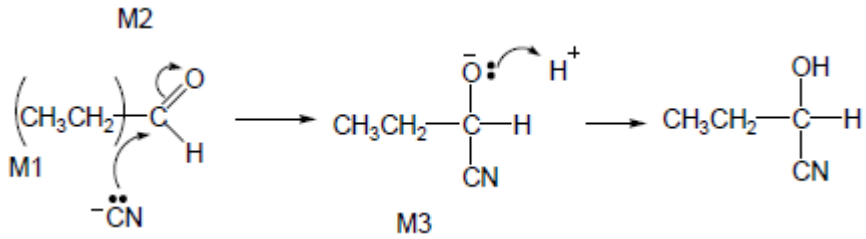
Mark Schemes

Q1.

(a) Nucleophilic addition

1

M4 for lp, arrow and H+

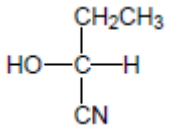


Allow C_2H_{5-} for CH_3CH_{2-}

- *M1 and M4 include lone pair and curly arrow.*
- *Allow: CN^- but arrow must start at lone pair on C.*
- *M2 not allowed independent of M1, but allow M1 for correct attack on C+.*
- *+ rather than δ+ on C=O loses M2.*
- *Penalise incorrect partial charges.*
- *M3 is for correct structure including minus sign but lone pair is part of M4.*
- *Penalise extra curly arrows in M4.*

4

(b) (i) M1

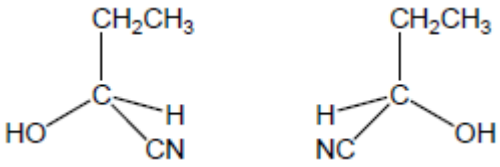


M1 for correct structure of product of part (a).
Allow C_2H_{5-} for CH_3CH_{2-}.
Penalise wrongly bonded, OH or CN or CH_2CH_3 once only in clip.

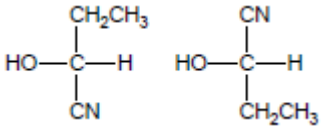
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M2

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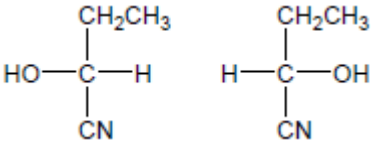


M2 cannot be gained by simply swapping two or more groups with no attempt to show a mirror image., e.g. do not allow M2 for



because these do not <u>show</u> the enantiomers as mirror images.

Students must <u>show</u> an attempt at mirror images, eg allow

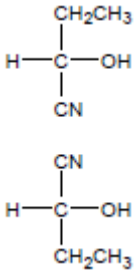


ie vertical groups same and horizontal swapped as if there was a mirror between them

No mirror need be shown

Do not penalize wedge bond when wedge comes into contact with both C & N

However these two could score M2 if placed as below as if with a "mirror" horizontally between them.



1

(ii) M1 (Plane) <u>polarized light</u>

M2 only scores following correct M1

1

M2 <u>Rotated</u> in <u>opposite</u> directions (equally) (only allow if M1 correct)
or close)

Not just in different directions but allow one rotates light to the left and one to the right.

Not molecules rotate.

1

(c) <u>2-hydroxybutane(-1-)nitrile</u>

1

(d) Weak acid / (acid) only slightly / partially dissociated / ionised

Ignore rate of dissociation.

1

$[CN^-]$ very low

Allow (very) few cyanide ions.

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Mark independently.

1

(e) (i) $H_2C{=}CH{-}CH_3 + NH_3 + \frac{3}{2}O_2 \longrightarrow H_2C{=}CH{-}CN + 3H_2O$

OR

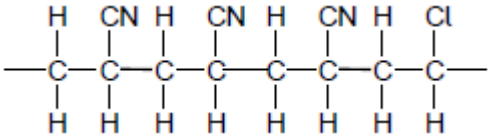
$H_2C{=}CH{-}CH_3 + NH_3 + 3O_2 \longrightarrow H_2C{=}CH{-}CN + 3H_2O_2$

OR doubled.

Allow C_3H_6 and CH_2CHCN or C_3H_3N on this occasion only.

1

(ii)

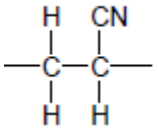
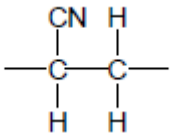
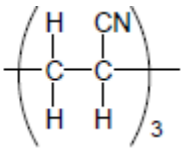


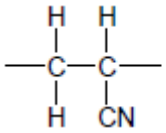
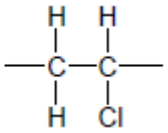
Ignore n.

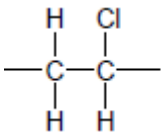
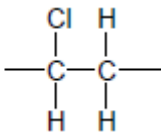
Must show trailing bonds.

Do not penalise C–NC bond here on this occasion.

Must contain, in any order,

3 of  or 3 of  or 

Allow  or 

and one of  or 

Allow –$CH_2CH(CN)CH_2CHCl$– etc.

1

(iii) Addition (polymerization)

Allow self-addition.

Do not allow additional.

1

[15]

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