

Cambridge AS & A Level

CHEMISTRY

Paper 1

Topical Past Paper Questions
+ Answer Scheme

2015 - 2021



Chapter 17

Carbonyl compounds

17.1 Aldehydes and ketones

1021. 9701_m22_qp_12 Q: 33

Which compound gives both:

- an orange precipitate with 2,4-DNPH reagent
- **and** a yellow precipitate with alkaline $I_2(aq)$?

- A ethanol
B methanal
C propanal
D propanone
-

1022. 9701_m21_qp_12 Q: 24

Which compound produces a ketone when refluxed with an acidified solution of potassium dichromate(VI)?

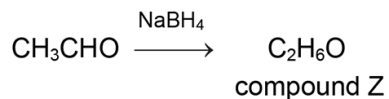
- A pentan-1-ol
B 2-methylbutan-1-ol
C 2-methylbutan-2-ol
D 3-methylbutan-2-ol
-

1023. 9701_m21_qp_12 Q: 27

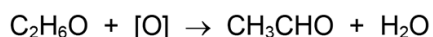
In this question you can assume that ^1H and ^3H have the same chemical properties.

A sample of ethanal contains only one isotope of hydrogen, ^1H .

It is reduced to compound Z, $\text{C}_2\text{H}_6\text{O}$, in a nucleophilic addition reaction using NaBH_4 . All the hydrogen atoms in the NaBH_4 are the ^3H isotope.



Compound Z is then oxidised back to ethanal and water.



Which statement about the final mixture of products is correct?

- A** Both ethanal and water contain ^3H atoms.
- B** Ethanal is the only product containing ^3H atoms.
- C** Neither ethanal nor water contain ^3H atoms.
- D** Water is the only product containing ^3H atoms.

1024. 9701_s21_qp_11 Q: 28

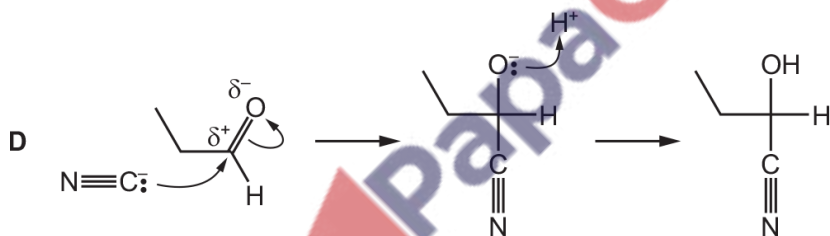
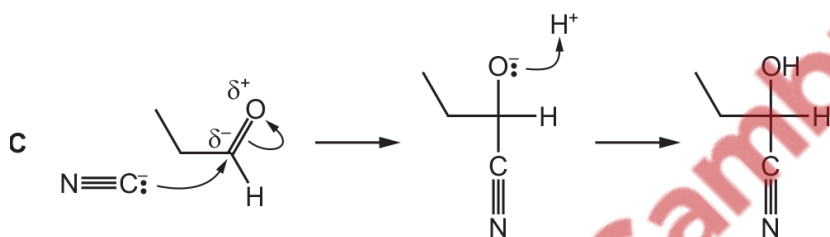
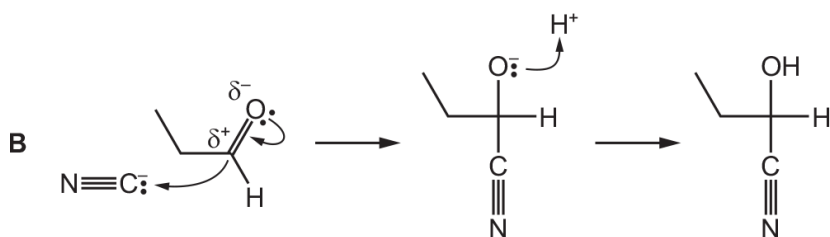
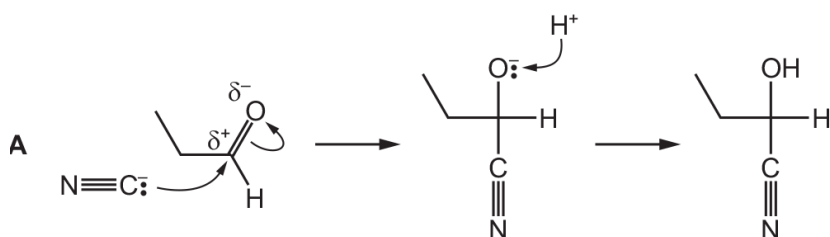
Which statement is correct for the reaction of carbonyl compounds with HCN ?

- A** The reaction is catalysed by concentrated H_2SO_4 .
- B** Pentan-2-one and HCN react to give a chiral product.
- C** The reaction is a condensation reaction.
- D** The reaction is nucleophilic substitution.



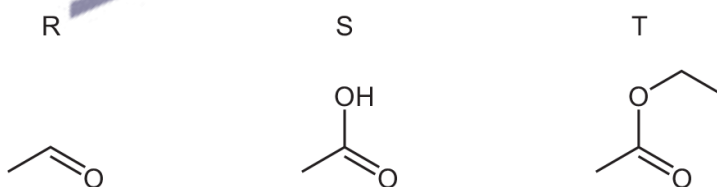
1025. 9701_s21_qp_12 Q: 28

Which reaction mechanism for the formation of $C_2H_5CH(OH)(CN)$ is correct?



1026. 9701_s21_qp_13 Q: 26

The skeletal formulae of three compounds are shown.

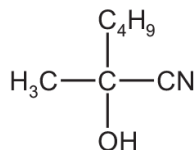


Which compounds will give a positive test with 2,4-dinitrophenylhydrazine reagent?

- A** R only **B** R and S only **C** S and T only **D** R, S and T

1027. 9701_s21_qp_13 Q: 27

The diagram shows the structure of a compound formed by the reaction of HCN with a carbonyl compound, X.



What is the mechanism of this reaction and what is the functional group in X?

	mechanism of reaction	functional group in X
A	electrophilic addition	aldehyde
B	electrophilic addition	ketone
C	nucleophilic addition	aldehyde
D	nucleophilic addition	ketone

1028. 9701_w21_qp_11 Q: 26

$\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_3$ reacts with hydrogen cyanide to form an organic product called a cyanohydrin.

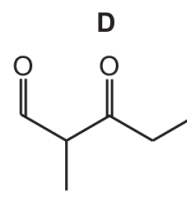
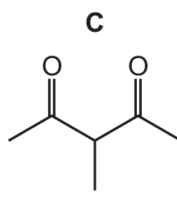
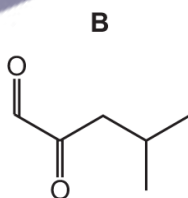
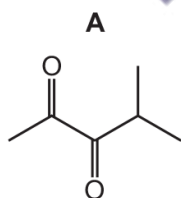
Which statement is correct?

- A** The cyanohydrin product has one chiral centre.
- B** The cyanohydrin product is formed by electrophilic addition.
- C** The cyanohydrin product is formed via an intermediate which contains a C–OH group.
- D** The formation of the cyanohydrin product requires the use of cyanide ions as a catalyst.

1029. 9701_w21_qp_11 Q: 27

Reduction of compound R with LiAlH_4 gives the compound 4-methylpentane-2,3-diol.

What could be the identity of compound R?



1030. 9701_w21_qp_12 Q: 28

Which compound produces a precipitate with 2,4-dinitrophenylhydrazine reagent **and** also with alkaline aqueous iodine?

- A butan-2-ol
- B butanal
- C butanone
- D pentan-3-one

1031. 9701_w21_qp_13 Q: 26

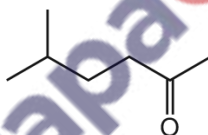
$\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_3$ reacts with hydrogen cyanide to form an organic product called a cyanohydrin.

Which statement is correct?

- A The cyanohydrin product has one chiral centre.
- B The cyanohydrin product is formed by electrophilic addition.
- C The cyanohydrin product is formed via an intermediate which contains a C–OH group.
- D The formation of the cyanohydrin product requires the use of cyanide ions as a catalyst.

1032. 9701_s20_qp_11 Q: 20

The skeletal formula of compound X is shown.



Which row is correct?

	molecular formula of X	observation on addition of X to Fehling's reagent
A	$\text{C}_7\text{H}_{14}\text{O}$	no change
B	$\text{C}_7\text{H}_{14}\text{O}$	red precipitate forms
C	$\text{C}_7\text{H}_{16}\text{O}$	no change
D	$\text{C}_7\text{H}_{16}\text{O}$	red precipitate forms

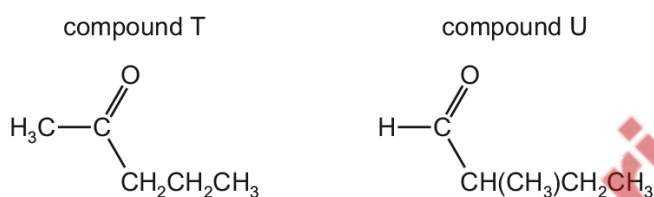
1033. 9701_s20_qp_12 Q: 22

Which row correctly shows the type of mechanism of each of the two reactions?

	$C_2H_5Br + KCN$	$CH_3COCH_3 + HCN$
A	electrophilic substitution	electrophilic addition
B	electrophilic substitution	nucleophilic addition
C	nucleophilic substitution	electrophilic addition
D	nucleophilic substitution	nucleophilic addition

1034. 9701_s20_qp_13 Q: 24

Which statement about compound T and compound U is correct?



- A** T and U are stereoisomers.
- B** T can be distinguished from U by the use of alkaline aqueous iodine.
- C** T can be reduced by LiAlH_4 but not by NaBH_4 .
- D** U can be formed by the oxidation of 3-methylbutan-1-ol.

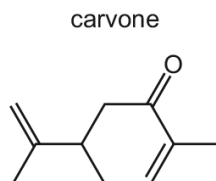
1035. 9701_w20_qp_11 Q: 27

Which pair of test results would prove that a substance, X, is a ketone?

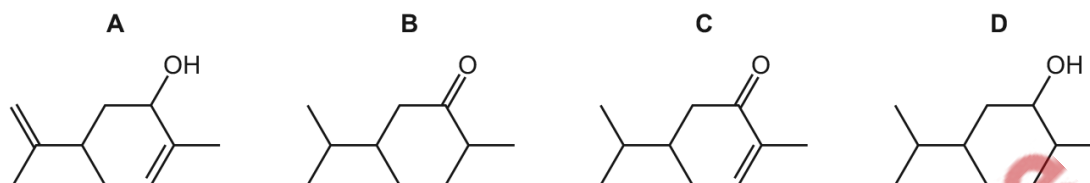
- A** X has no reaction with Tollens' reagent. X reacts with alkaline aqueous iodine.
- B** X is reduced by lithium aluminium hydride. X is oxidised by acidified dichromate(VI).
- C** X reacts with 2,4-DNPH reagent. X has no reaction with Fehling's reagent.
- D** X reacts with hydrogen cyanide. X is reduced by lithium aluminium hydride.

1036. 9701_w20_qp_11 Q: 28

Carvone is found in spearmint oil.

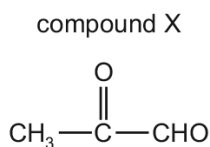


Which product is formed when carvone is reacted with NaBH₄?



1037. 9701_w20_qp_12 Q: 23

Compound X contains two functional groups.



Which reagent will react with **only one** of the functional groups?

- A** acidified potassium dichromate(VI)
- B** 2,4-DNPH reagent
- C** hydrogen cyanide
- D** NaBH₄

1038. 9701_w20_qp_12 Q: 25

Diols in which both hydroxy groups are bonded to the same carbon atom can spontaneously eliminate a molecule of water to produce a carbonyl compound.

Which compound, after complete hydrolysis, gives a silver mirror with Tollens' reagent?

- A** 1,1-dibromobutane
- B** 1,2-dibromobutane
- C** 1,3-dibromobutane
- D** 2,2-dibromobutane

1039. 9701_s19_qp_11 Q: 29

Which reagent may be used to distinguish between propanone and ethanol?

- A 2,4-dinitrophenylhydrazine
- B bromine water
- C Fehling's reagent
- D Tollens' reagent

1040. 9701_s19_qp_12 Q: 27

Which reagent could be used to distinguish between ethanal and propanal?

- A 2,4-dinitrophenylhydrazine
- B $I_2/NaOH(aq)$
- C $K_2Cr_2O_7/H_2SO_4(aq)$
- D Tollens' reagent

1041. 9701_s19_qp_13 Q: 28

Structural isomerism **only** should be considered when answering this question.

A set of isomeric compounds, with molecular formula $C_5H_{10}O$, all react in a 1:1 ratio with an excess of HCN by nucleophilic addition.

How many isomeric compounds are in the set?

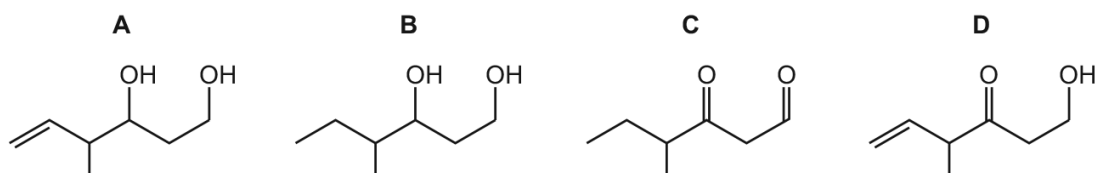
- A 5
- B 6
- C 7
- D 8

1042. 9701_w19_qp_11 Q: 26

The diagram shows the structure of compound Z.



What is the product of the reaction between compound Z and an excess of $NaBH_4$?



1043. 9701_w19_qp_11 Q: 27

Compound Q shows the following reactions.

- It gives an orange precipitate with 2,4-dinitrophenylhydrazine.
- It gives a red-brown precipitate with Fehling's reagent.
- It gives a pale yellow precipitate with alkaline aqueous iodine.

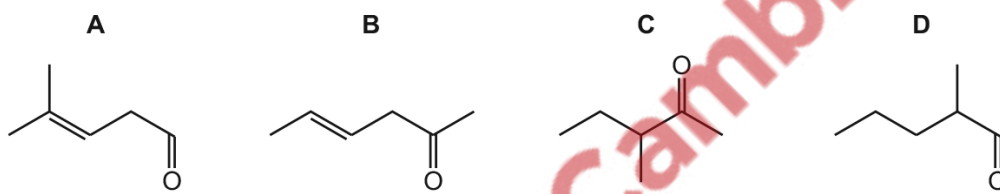
What could be the identity of Q?

- A** ethanal
B propan-2-ol
C propanal
D propanone

1044. 9701_w19_qp_12 Q: 26

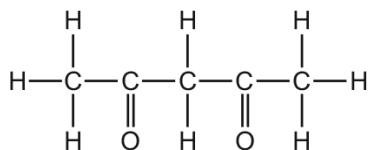
Compound X has stereoisomers and forms a precipitate when warmed with Fehling's reagent.

What could be the structure of compound X?



1045. 9701_w19_qp_12 Q: 27

The diagram shows the structure of Y.



Two suggestions are made about Y.

- 1 Y can be oxidised by hot, acidified dichromate(VI) ions.
- 2 One mole of Y gives one mole of tri-iodomethane when it reacts with an excess of alkaline aqueous iodine.

Which suggestions are correct?

- A both 1 and 2
- B 1 only
- C 2 only
- D neither 1 nor 2

1046. 9701_m18_qp_12 Q: 26

Compound X produces a carboxylic acid when heated under reflux with acidified potassium dichromate(VI). Compound X does not react with sodium metal.

What could be the identity of compound X?

- A propanal
- B propanone
- C propan-1-ol
- D propan-2-ol




1047. 9701_s18_qp_11 Q: 25

Compound Q

- contains a chiral centre,
- gives a positive result with Fehling's reagent,
- gives a positive result with alkaline aqueous iodine.

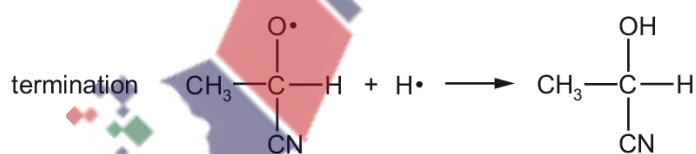
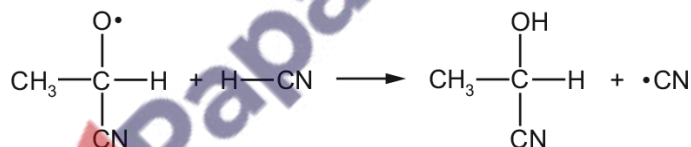
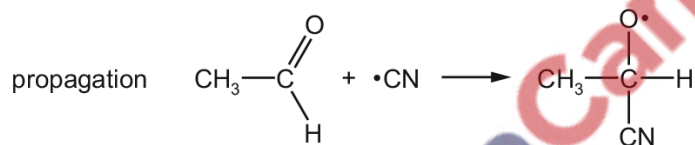
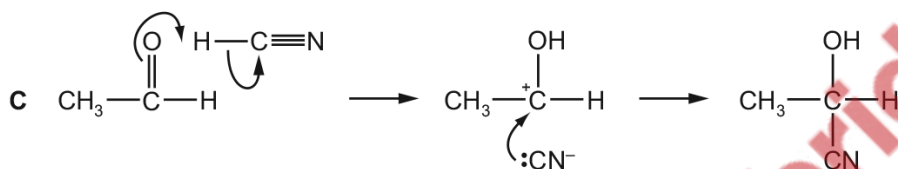
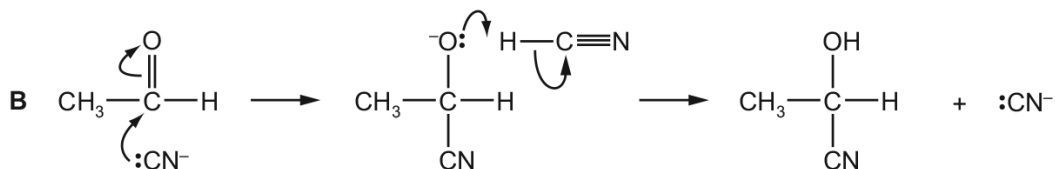
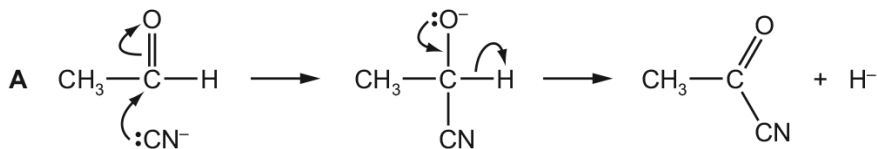
What could compound Q be?

- A** 1-hydroxybutanone
B 2-hydroxybutanal
C 3-hydroxybutanal
D 3-hydroxybutanone
-

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1048. 9701_s18_qp_11 Q: 26

What is the mechanism for the reaction of ethanal, CH_3CHO , with hydrogen cyanide, HCN , in the presence of NaCN ?



1049. 9701_s18_qp_12 Q: 27

Which statement about butanone is correct?

- A Butanone can be dehydrated by concentrated sulfuric acid to give $\text{CH}_2=\text{CHCH}=\text{CH}_2$.
- B Butanone gives a positive result with Tollens' reagent.
- C Butanone reacts with HCN by an electrophilic addition mechanism.
- D Butanone reacts with NaBH_4 to give a chiral product.

1050. 9701_w18_qp_11 Q: 27

Which compound shows optical isomerism and gives a positive test with alkaline aqueous iodine?

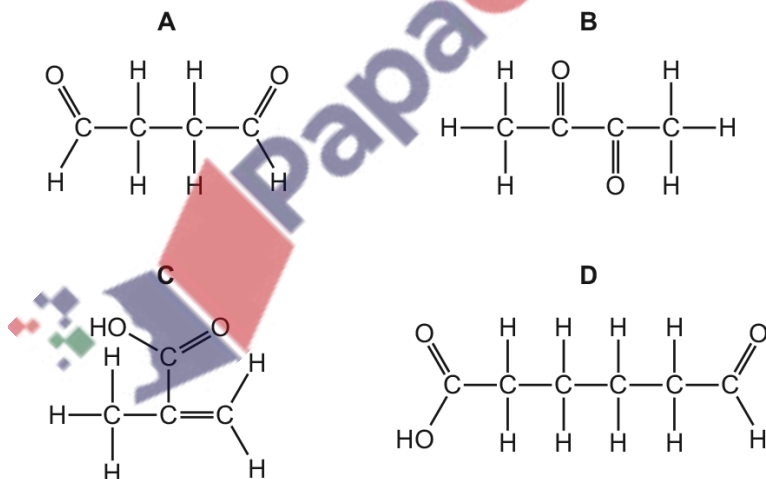
- A $\text{CH}_3\text{COCH}(\text{OH})\text{CH}_3$
- B $\text{CH}_3\text{COCH}_2\text{CH}_2\text{OH}$
- C $\text{HOCH}_2\text{CH}(\text{CH}_3)\text{CHO}$
- D $(\text{CH}_3)_2\text{C}(\text{OH})\text{CHO}$

1051. 9701_w18_qp_12 Q: 27

Compound X has the empirical formula $\text{C}_2\text{H}_3\text{O}$.

Compound X reacts with 2,4-dinitrophenylhydrazine reagent to give an orange precipitate and also decolourises warmed acidified potassium manganate(VII) solution.

What could be the identity of X?



1052. 9701_m17_qp_12 Q: 25

Diols in which both hydroxy groups are bonded to the same carbon can spontaneously eliminate a molecule of water to produce a carbonyl compound.

Which compound, after complete hydrolysis, gives a positive reaction with Tollens' reagent?

- A 1,1-dibromobutane
 - B 1,2-dibromobutane
 - C 1,3-dibromobutane
 - D 2,2-dibromobutane
-

1053. 9701_m17_qp_12 Q: 28

$\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_3$ reacts with hydrogen cyanide to form an organic product called a cyanohydrin.

Which statement is correct?

- A The cyanohydrin product has one chiral centre.
 - B The cyanohydrin product is formed by electrophilic addition.
 - C The cyanohydrin product is formed via an intermediate which contains a C–OH group.
 - D The formation of the cyanohydrin product requires the use of cyanide ions as a catalyst.
-

1054. 9701_m17_qp_12 Q: 29

Compound X, $\text{CH}_3\text{CH}(\text{OH})\text{CH}(\text{CHO})\text{CH}_3$, is heated under reflux with an excess of acidified $\text{K}_2\text{Cr}_2\text{O}_7$ to form compound Y.

Both X and Y are separately warmed with Fehling's solution and the observations noted.

What are the observations?

- A Both X and Y give a red precipitate.
 - B Only X gives a red precipitate.
 - C Only Y gives a red precipitate.
 - D Neither X nor Y gives a red precipitate.
-

1055. 9701_s17_qp_11 Q: 20

Structural isomerism and stereoisomerism should be considered when answering this question.

Each of the following carbonyl compounds is reacted with NaBH_4 . The product of each reaction is heated with Al_2O_3 at 600°C , generating one product or a mixture of isomers.

Which carbonyl compound will produce the most isomers?

- A butanal
- B butanone
- C pentan-3-one
- D propanone

1056. 9701_s17_qp_11 Q: 25

Diols in which both hydroxy groups are bonded to the same carbon atom spontaneously eliminate a molecule of water to produce a carbonyl compound.

Which compound is hydrolysed to form a product that gives a positive reaction with 2,4-dinitrophenylhydrazine but **not** with Fehling's reagent?

- A 1,1-dibromopropane
- B 1,2-dibromopropane
- C 1,3-dibromopropane
- D 2,2-dibromopropane

1057. 9701_s17_qp_11 Q: 29

Which compound gives a positive test with alkaline aqueous iodine and does **not** show optical isomerism?

- A $\text{CH}_3\text{COCH}_2\text{CH}_2\text{OH}$
- B $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CHO}$
- C $\text{CH}_3\text{COCH}(\text{OH})\text{CH}_3$
- D $(\text{CH}_3)_2\text{C}(\text{OH})\text{CHO}$

1058. 9701_s17_qp_12 Q: 20

A carbonyl compound **X** will react with HCN in the presence of NaCN to make a compound with M_r 85. Compound **X** does **not** react with Fehling's reagent.

What is **X**?

- A butanal
 - B butanone
 - C propanal
 - D propanone
-

1059. 9701_s17_qp_12 Q: 27

$\text{H}_2\text{NNHC}_6\text{H}_3(\text{NO}_2)_2$ is the structural formula of 2,4-DNPH.

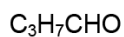
Many, but not all, organic reactions need to be heated before reaction occurs.

Which reaction occurs at a good rate at room temperature (20 °C)?

- A** $\text{C}_{10}\text{H}_{22} \rightarrow \text{C}_8\text{H}_{18} + \text{C}_2\text{H}_4$
B $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br} + \text{NH}_3 \rightarrow \text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2 + \text{HBr}$
C $\text{CH}_3\text{CH}_2\text{OH} + \text{KBr} \rightarrow \text{CH}_3\text{CH}_2\text{Br} + \text{KOH}$
D $(\text{CH}_3)_2\text{CO} + \text{H}_2\text{NNHC}_6\text{H}_3(\text{NO}_2)_2 \rightarrow (\text{CH}_3)_2\text{C}=\text{NNHC}_6\text{H}_3(\text{NO}_2)_2 + \text{H}_2\text{O}$

1060. 9701_s17_qp_13 Q: 22

The formulae of three compounds are shown.



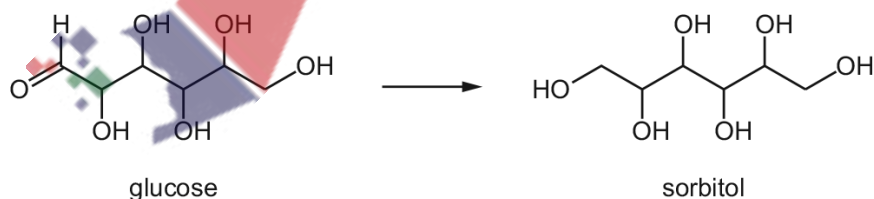
Only one of these compounds will decolourise bromine water. Only one of these compounds will produce a silver mirror with Tollens' reagent.

Which row shows the correct results?

	decolourises bromine water	forms a silver mirror with Tollens' reagent
A	$\text{C}_3\text{H}_7\text{CHO}$	$\text{C}_2\text{H}_5\text{COCH}_3$
B	$\text{C}_2\text{H}_5\text{COCH}_3$	$\text{C}_3\text{H}_7\text{CHO}$
C	$\text{CH}_2\text{CHCH}_2\text{CH}_2\text{OH}$	$\text{C}_2\text{H}_5\text{COCH}_3$
D	$\text{CH}_2\text{CHCH}_2\text{CH}_2\text{OH}$	$\text{C}_3\text{H}_7\text{CHO}$

1061. 9701_w17_qp_11 Q: 26

Glucose can be used to prepare sorbitol, a compound used as a sugar substitute.



Which reagent may be used for this conversion?

- A** acidified potassium dichromate(VI)
B sodium borohydride
C sodium hydroxide
D Tollens' reagent

1062. 9701_w17_qp_12 Q: 24

2,3-dimethylpent-2-ene, $(\text{CH}_3)_2\text{C}=\text{C}(\text{CH}_3)\text{CH}_2\text{CH}_3$, is treated with cold, dilute KMnO_4 . The product of this reaction is treated with an excess of concentrated H_2SO_4 at 180°C , giving a mixture of isomeric hydrocarbons with molecular formula C_7H_{12} .

What is the name of one of the isomeric hydrocarbons?

- A 2,3-dimethylpenta-1,2-diene
 - B cis-2,3-dimethylpenta-1,3-diene
 - C 2,3-dimethylpenta-1,4-diene
 - D 3,4-dimethylpenta-1,3-diene
-

1063. 9701_w17_qp_12 Q: 29

Compound G

- has a chiral centre,
- gives a positive result with alkaline aqueous iodine,
- does not give a silver mirror with Tollens' reagent.

What could compound G be?

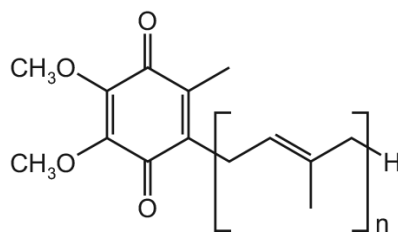
- A 1-hydroxybutan-2-one
 - B 2-hydroxybutanal
 - C 3-hydroxybutanal
 - D 3-hydroxybutan-2-one
-

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1064. 9701_m16_qp_12 Q: 20

People who take statin drugs to control their blood cholesterol may also take 'coenzyme Q₁₀'.

The diagram shows a simplified structure of one form of this coenzyme.



coenzyme Q₁₀

Which row describes this structure correctly?

	the coenzyme is	number of π bonds in one molecule
A	an aldehyde	$n + 2$
B	an aldehyde	$n + 4$
C	a ketone	$n + 2$
D	a ketone	$n + 4$

1065. 9701_s16_qp_11 Q: 24

Alcohol Y gives product Z after mild oxidation. Z gives a positive result with Tollens' reagent and with 2,4-dinitrophenylhydrazine reagent.

What could be the identity of alcohol Y?

- A** butan-1-ol
- B** butan-2-ol
- C** butan-2,3-diol
- D** 2-methylbutan-2-ol

1066. 9701_s16_qp_11 Q: 28

Which reagent **cannot** be used to distinguish between ethanal and propanone?

- A** acidified sodium dichromate(VI) solution
- B** alkaline aqueous iodine
- C** cold acidified potassium manganate(VII) solution
- D** Fehling's reagent

1067. 9701_s16_qp_12 Q: 26

Which organic compound would **not** give **either** a yellow precipitate when treated with alkaline aqueous iodine **or** an orange precipitate when treated with 2,4-dinitrophenylhydrazine reagent?

- A propanal
- B propan-1-ol
- C propan-2-ol
- D propanone

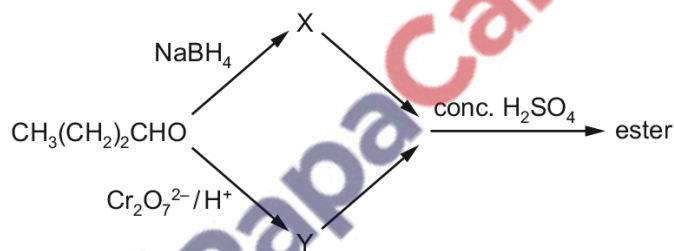
1068. 9701_s16_qp_12 Q: 27

In which reaction is the organic compound oxidised?

- A $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO} + \text{Tollens' reagent}$
- B $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO} + \text{LiAlH}_4$
- C $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH} + \text{concentrated H}_3\text{PO}_4$
- D $\text{CH}_3\text{CO}_2\text{C}_2\text{H}_5 + \text{dilute H}_2\text{SO}_4$

1069. 9701_s16_qp_13 Q: 22

An ester with an aroma of pineapples can be synthesised in the laboratory from butanal using this reaction scheme.

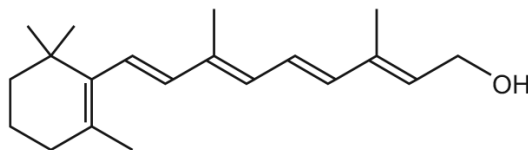


What is the structural formula of the **ester**?

- A $\text{CH}_3(\text{CH}_2)_2\text{CO}_2(\text{CH}_2)_2\text{CH}_3$
- B $\text{CH}_3(\text{CH}_2)_2\text{CO}_2(\text{CH}_2)_3\text{CH}_3$
- C $\text{CH}_3(\text{CH}_2)_3\text{CO}_2(\text{CH}_2)_2\text{CH}_3$
- D $\text{CH}_3(\text{CH}_2)_3\text{CO}_2(\text{CH}_2)_3\text{CH}_3$

1070. 9701_s16_qp_13 Q: 24

Vitamin A contains retinol.



retinol

Under appropriate conditions, acidified $\text{KMnO}_4(\text{aq})$ can be used to break apart $\text{C}=\text{C}$ bonds.

After these bonds have been broken, further oxidation of the fragments may occur.

Under which conditions is the acidified $\text{KMnO}_4(\text{aq})$ used and what do the final oxidation products include?

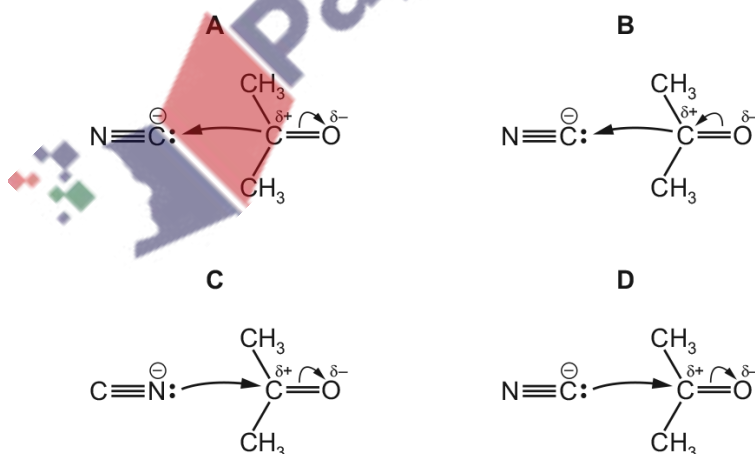
	conditions	final oxidation products
A	cold, dilute	aldehydes and carboxylic acids
B	cold, dilute	ketones and carboxylic acids
C	hot, concentrated	aldehydes and carboxylic acids
D	hot, concentrated	ketones and carboxylic acids

1071. 9701_w16_qp_11 Q: 26

Propanone reacts with an aqueous mixture of HCN and NaCN by a nucleophilic addition mechanism.

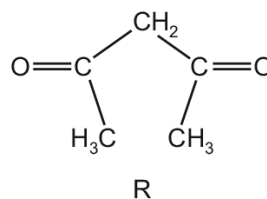
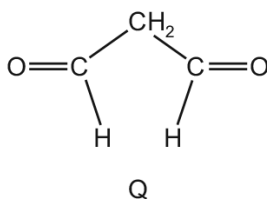
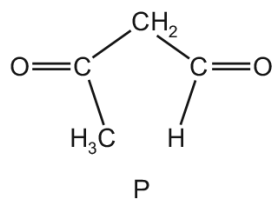
The first stage of the mechanism involves attack by cyanide ions.

Which diagram correctly represents this?



1072. 9701_w16_qp_11 Q: 27

P, Q and R are carbonyl compounds.



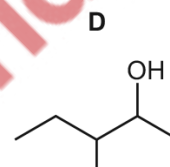
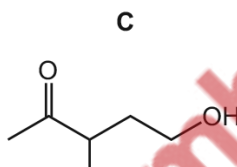
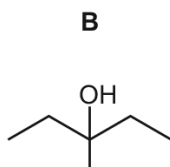
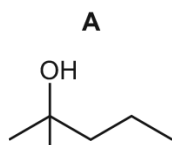
Fehling's solution can be used to help identify these compounds.

Which compounds form a red-brown precipitate on warming with Fehling's solution?

- A** P, Q and R **B** P and Q only **C** P only **D** Q only

1073. 9701_w16_qp_12 Q: 25

Which compound can be oxidised by acidified potassium manganate(VII) to give 3-methylpentan-2-one?



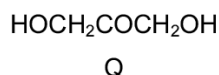
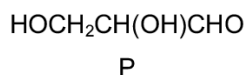
1074. 9701_w16_qp_12 Q: 28

Which row correctly describes the reactivity of aldehydes and ketones?

	with NaBH ₄	with H ⁺ /Cr ₂ O ₇ ²⁻ (aq)
A	both react	both react
B	both react	only aldehydes react
C	only ketones react	both react
D	only ketones react	only aldehydes react

1075. 9701_s15_qp_11 Q: 20

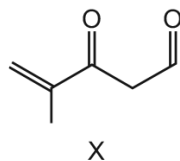
Which reagent will give a different observation with compounds P and Q?



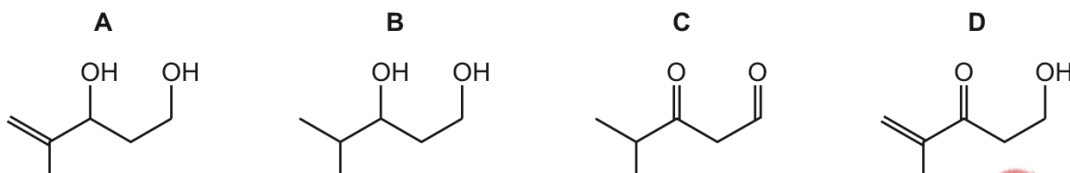
- A** Br₂(aq)
B hot acidified KMnO₄
C silver nitrate in ammonia solution
D warm acidified K₂Cr₂O₇

1076. 9701_s15_qp_12 Q: 27

The diagram shows the structure of compound X.

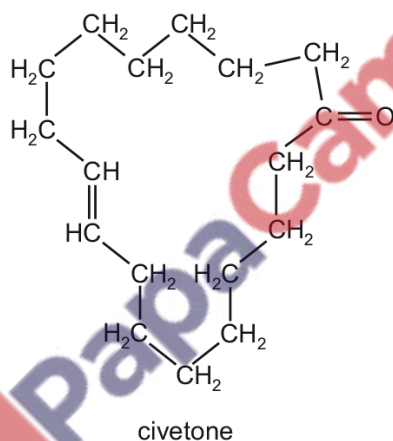


What is the product of the reaction between compound X and an excess of NaBH₄?



1077. 9701_s15_qp_13 Q: 24

The naturally-occurring molecule civetone is found in a gland of the African civet cat and has been used in perfumery.



Which reagent will **not** react with civetone?

- A 2,4-dinitrophenylhydrazine reagent
- B Fehling's reagent
- C hydrogen bromide
- D sodium tetrahydridoborate(III), NaBH₄

1078. 9701_w15_qp_11 Q: 26

Which compound **cannot** be oxidised by acidified potassium dichromate(VI) solution but **does** react with sodium metal?

- A $(\text{CH}_3)_3\text{COH}$
- B $\text{CH}_3\text{COCH}_2\text{CH}_3$
- C $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$
- D $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CH}_3$

1079. 9701_w15_qp_11 Q: 27

Butan-2-ol can be made by reducing X with H_2/Ni .

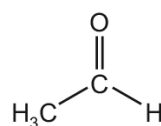
Butan-2-ol can be dehydrated to form Y and Z which are structural isomers of each other.

Which row is correct?

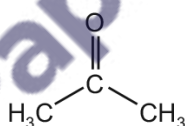
	X is	<i>cis-trans</i> isomerism is shown by
A	an aldehyde	both Y and Z
B	an aldehyde	only one of Y and Z
C	a ketone	both Y and Z
D	a ketone	only one of Y and Z

1080. 9701_w15_qp_11 Q: 28

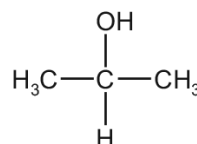
Tollens' reagent can be used to help identify compounds P, Q and R.



P



Q



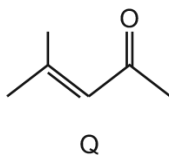
R

Which compound(s) form a silver precipitate on warming with Tollens' reagent?

- A** P and Q
- B** P only
- C** Q only
- D** R only


1081. 9701_w15_qp_12 Q: 23

Compound Q can be made from propanone.



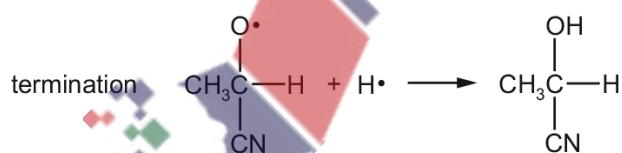
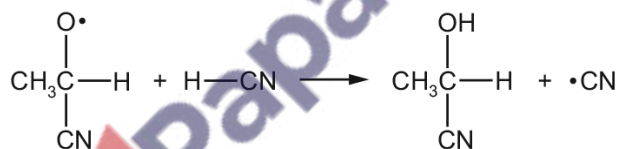
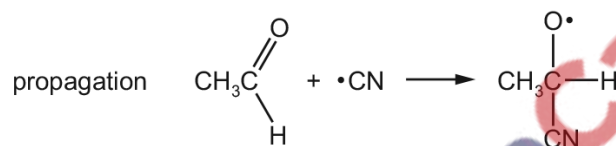
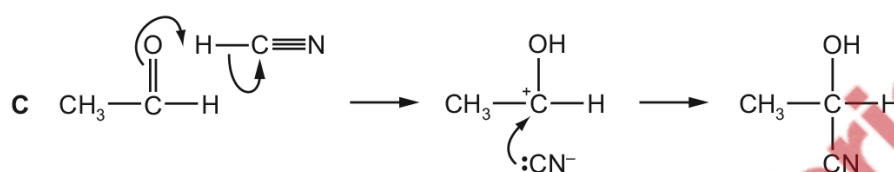
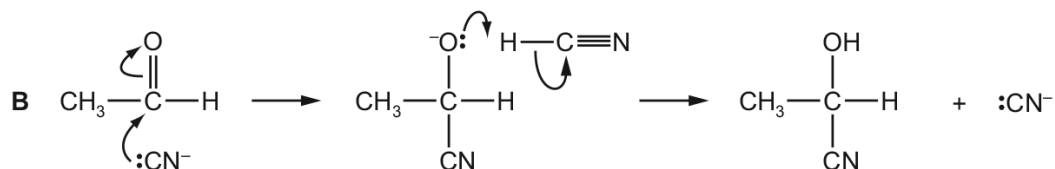
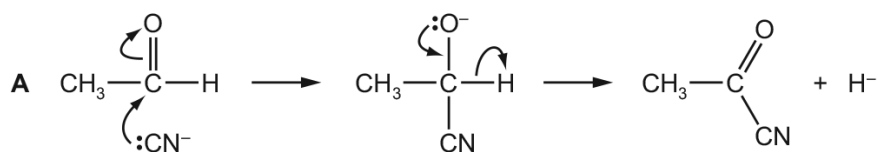
Which types of reaction will Q undergo?

- A nucleophilic addition and electrophilic addition
 - B nucleophilic addition and nucleophilic substitution
 - C nucleophilic addition only
 - D nucleophilic substitution and electrophilic addition
-

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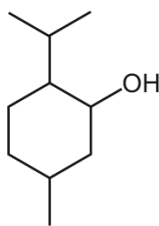
1082. 9701_w15_qp_12 Q: 27

What is the mechanism for the reaction of ethanal, CH_3CHO , with hydrogen cyanide, HCN , in the presence of a base?

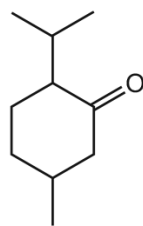


1083. 9701_w15_qp_12 Q: 28

Menthol and menthone are both found in peppermint oil.



menthol



menthone

Which statement about these compounds is correct?

- A Both compounds can undergo mild oxidation.
- B Both compounds will give an orange precipitate with 2,4-dinitrophenylhydrazine reagent.
- C Menthol can be formed from menthone by reaction with NaBH_4 .
- D Menthone gives a positive test when warmed with Tollens' reagent.

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