CHEMISTRY ONLINE
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CHEMISTRY

ORGANIC CHEMISTRY II

Level & Board	AQA (A-LEVEL)
TOPIC:	OPTICAL ISOMERISM
PAPER TYPE:	QUESTION PAPER - 3
TOTAL QUESTIONS	10
TOTAL MARKS	/33

Optical Isomerism - 3

1. Alcohol X has the structure $(CH_3)_2C(OH)CH(CH_3)_2$

(a) Name alcohol X.

(1)

(b) Name and outline the mechanism for the reaction occurring when alcohol X is converted into 2,3-dimethylbut-2-ene in the presence of a strong acid.

(3)

2. Consider the following pair of isomers

C

D

(a) Name compound C.

(1)

(b) Identify a reagent which could be used in a test-tube reaction to distinguish between C and D. In each case, state what you would observe.

(3)

3. What word is used to describe optically active molecules?

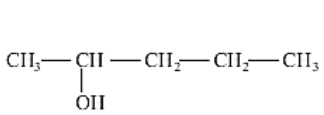
(1)

4. Give two examples of chiral molecules.

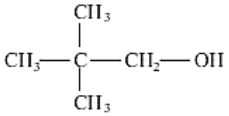
Draw one of them (both enantiomers).

(3)

5. The structures of two alcohols of formula $C_5H_{11}OH$ are shown below.



pentan–2–ol



2.2–dimethylopropan–1–ol

(a) A third alcohol of formula $C_5H_{11}OH$ is tertiary.
Draw the graphical formula and give the name of this alcohol.

(2)

(b) Draw the graphical formulae of two alkenes formed when pentan-2-ol is heated with concentrated sulphuric acid.

(2)

(c) State the type of reaction taking place**.**

(1)

(d) Explain why the type of reaction taking place does not occur when 2,2-dimethylpropan-1-ol is heated with concentrated sulphuric acid.

(1)

6. Two isomeric esters E and F formed from methanol have the molecular formula $C_6H_{12}O_2$ Isomer E has only 2 singlet peaks in its proton n.m.r. spectrum.
Isomer F is optically active.

Draw the structures of these two isomers.

I am Sorry !!!!!

(2)

7. Choose an alkene with molecular formula C_4H_8 which reacts with HBr to form two structural isomers.

Give the structures of these two isomers and name the type of structural isomerism shown.

Outline a mechanism for the formation of the major product**.**

(6)

8. What effect does the racemic mixture have on plane polarised light?

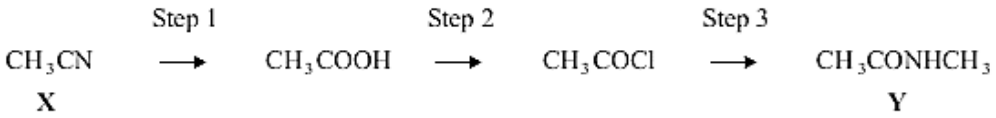
(2)

9. Draw the structure of the acetal ($C_4H_8O_2$) formed by the reaction of ethanal with ethane-1,2-diol.

(1)

I am Sorry !!!!

10. Compound X is converted into compound Y by the reactions outlined below



(a) Give the name of compound X.

(1)

(b) State the type of reaction taking place in Step 1.

(1)

(c) Write an equation for the reaction taking place in Step 3.

(2)

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