



CHEMISTRY ONLINE
— TUITION —

Phone: +442081445350

www.chemistryonlinetuition.com

Email: asherrana@chemistryonlinetuition.com

CHEMISTRY

ORGANIC CHEMISTRY II

Level & Board	AQA (A-LEVEL)
TOPIC:	OPTICAL ISOMERISM
PAPER TYPE:	QUESTION PAPER - 1
TOTAL QUESTIONS	10
TOTAL MARKS	/31

ChemistryOnlineTuition Ltd reserves the right to take legal action against any individual/ company/organization involved in copyright abuse.

Optical Isomerism - 1

1. What are the similarities and differences between two optical isomers?

(4)

2. Which one of the following can exhibit both geometrical and optical isomerism?

- A. $(\text{CH}_3)_2\text{C}=\text{CHCH}(\text{CH}_3)\text{CH}_2\text{CH}_3$
- B. $\text{CH}_3\text{CH}_2\text{CH}=\text{CHCH}(\text{CH}_3)\text{CH}_2\text{CH}_3$
- C. $(\text{CH}_3)_2\text{C}=\text{C}(\text{CH}_2\text{CH}_3)_2$
- D. $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}(\text{CH}_3)\text{C}=\text{CH}_2$

(1)

3. Butanone is reduced in a two-step reaction using NaBH_4 followed by dilute hydrochloric acid.

(a) Write an overall equation for the reduction of butanone using $[\text{H}]$ to represent the reductant.

(1)

(b) By considering the mechanism of the reaction, explain why the product has no effect on plane polarised light.

(6)

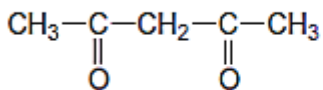
4. Which one of the following reactions will produce an organic compound that has optical isomers?

- A. dehydration of butan-2-ol by heating with concentrated sulphuric acid
- B. reduction of pentan-3-one by warming with NaBH_4
- C. addition of Br_2 to 3-bromopropene
- D. reduction of 2,3-dimethylpent-2-ene with H_2 in the presence of a nickel catalyst

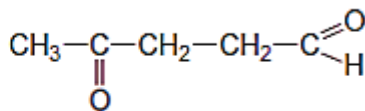
(1)

5. State how you could distinguish between compounds J and K by a simple test-tube reaction.

State how you could distinguish between J and K by giving the number of peaks in the ^1H n.m.r. spectrum of each compound.



J

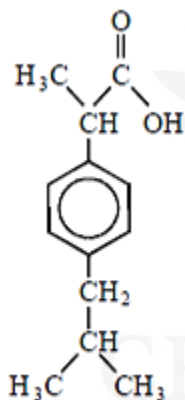


K

(5)

6. Ibuprofen is a drug used as an alternative to aspirin for the relief of pain, fever and inflammation.

The structure of ibuprofen is shown below.



Which one of the following statements is not correct?

- A.** It has optical isomers.
B. It liberates carbon dioxide with sodium carbonate solution.
C. It undergoes esterification with ethanol.
D. It undergoes oxidation with acidified potassium dichromate(VI).

(1)

7. Draw the structure of each of the following isomers of $C_5H_8O_2$

Label each structure you draw with the correct letter L, M, N, P or Q.

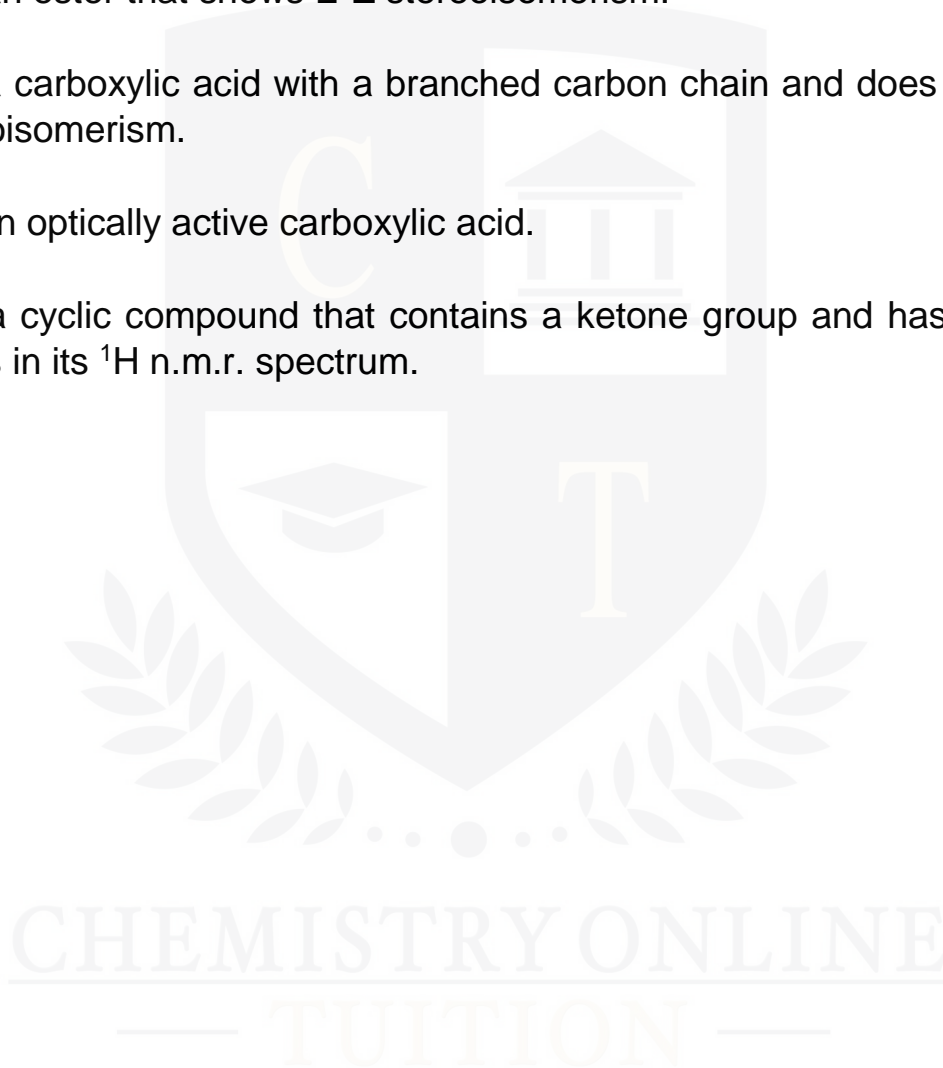
L is methyl 2-methylpropenoate.

M is an ester that shows E-Z stereoisomerism.

N is a carboxylic acid with a branched carbon chain and does not show stereoisomerism.

P is an optically active carboxylic acid.

Q is a cyclic compound that contains a ketone group and has only two peaks in its 1H n.m.r. spectrum.



(5)

8. Which one of the following statements about but-2-enal, $CH_3CH=CHCHO$, is not true?

- A. It has stereoisomers.
- B. It shows a strong absorption in the infra-red at about 1700 cm^{-1} .
- C. It will turn an acidified solution of potassium dichromate(VI) green.

D. It can be dehydrated by concentrated sulphuric acid.

(1)

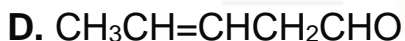
9. The carbonyl compound $\text{CH}_3\text{CH}_2\text{CHO}$ reacts very slowly with HCN .

Name and outline a mechanism for the reaction of $\text{CH}_3\text{CH}_2\text{CHO}$ with HCN .



(5)

10. On reduction, a racemate can be formed by:



(1)

I am Sorry !!!!!



DR. ASHAR RANA



**CHEMISTRY ONLINE
— TUITION —**

Phone: +442081445350
www.chemistryonlinetuition.com
Email: asherrana@chemistryonlinetuition.com

- Founder & CEO of Chemistry Online Tuition Ltd.
- Tutoring students in UK and worldwide since 2008
- Chemistry, Physics, and Math's Tutor

CONTACT INFORMATION FOR CHEMISTRY ONLINE TUITION

- UK Contact: 02081445350
- International Phone/WhatsApp: 00442081445350
- Website: www.chemistryonlinetuition.com
- Email: asherrana@chemistryonlinetuition.com
- Address: 210-Old Brompton Road, London SW5 OBS, UK