CHEMISTRY ONLINE
TUITION

Phone: +442081445350

www.chemistryonlinetuition.com

Email:asherrana@chemistryonlinetuition.com

CHEMISTRY

ORGANIC CHEMISTRY II

Level & Board	AQA (A-LEVEL)
TOPIC:	ORGANIC SYNTHESIS
PAPER TYPE:	QUESTION PAPER - 4
TOTAL QUESTIONS	10
TOTAL MARKS	/37

Organic Synthesis - 4

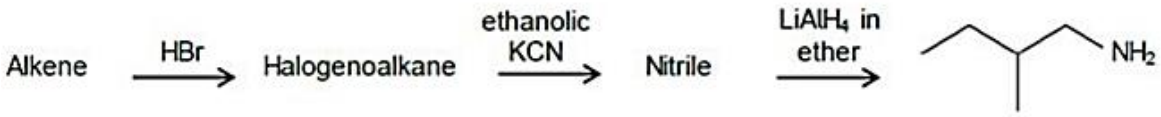
1. Describe how propanal, CH_3CH_2CHO, and propanone, CH_3COCH_3, can be distinguished using a chemical test and the number of peaks in their proton n.m.r. spectra.

(5)

2. What does being insoluble and soluble in water indicate about a compound?

(3)

3. 2-Methylbutylamine can be synthesised from an alkene.



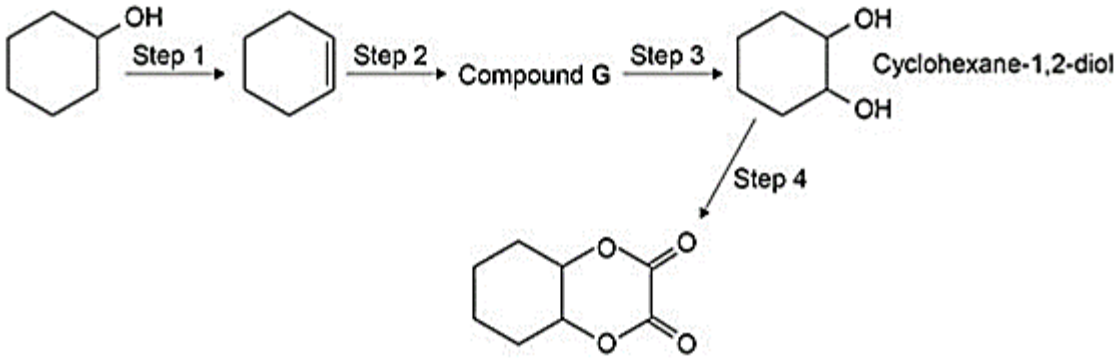
What is the identity of the alkene?

A. But-2-ene

B. Methylpropene
C. 2-Methylbut-1-ene
D. 2-Methylbut-2-ene

(1)

4. This question is about making a diester from cyclohexanol.



(a) State the type of reaction in step 1.

Give the name of the reagent needed for step 1.

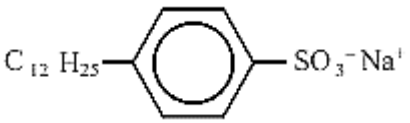
(2)

(b) State the reagents needed and give equations for step 2 and step 3.

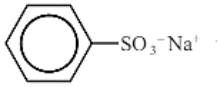
Show the structure of Compound G in your equations.

(4)

5. An important industrial compound, S, has the formula



(a) Name the reagents and give the conditions where necessary for the two steps needed to make



from benzene.

(3)

(b) Name the type of reaction in each step.

(2)

6. Explain why aldehydes react with Tollen's (or Fehling's) reagent but ketones do not.

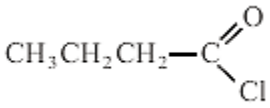
(3)

7. Compound $CH_3COC_2H_5$ reacts with HCN.

Give the name of the type of mechanism, and an outline of the mechanism for this reaction.

(5)

8. Compound is shown below



(a) Name compound.

(1)

(b) State why the mass spectrum of this compound contains two molecular ion peaks.

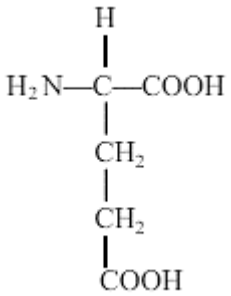
(1)

(c) Give the m/z values of these two peaks.

(1)

9. Glutamic acid is also an amino acid.

The formula of glutamic acid is shown below.



Glutamic acid exists as two optical isomers whereas glycine does not.

(a) Why is glutamic acid chiral?

(1)

(b) How can the two optical isomers of glutamic acid be distinguished from each other?

(2)

10. Polyamides are made from a diacid dichloride and a diamine they are condensation polymers.

(a) Explain the term condensation polymer.

(1)

(b) Suggest the structural formula of a diacid dichloride and a diamine that could be reacted to form a polyamide.

(2)

DR. ASHAR RANA

CHEMISTRY ONLINE TUITION

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

- Founder & CEO of Chemistry Online Tuition Ltd.
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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