



# **A-Level Chemistry**

## **Organic Synthesis (Multiple Choice)**

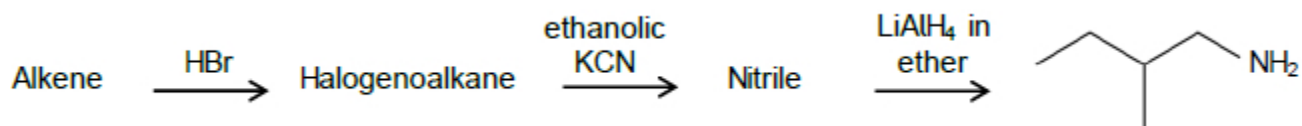
### **Question Paper**

**Time available: 12 minutes**

**Marks available: 11 marks**

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1. 2-Methylbutylamine can be synthesised from an alkene.

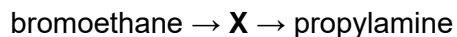


What is the identity of the alkene?

- A But-2-ene
- B Methylpropene
- C 2-Methylbut-1-ene
- D 2-Methylbut-2-ene

(Total 1 mark)

2. A two-step preparation of propylamine is shown.



What is X?

- A  $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$
- B  $\text{CH}_3\text{CH}_2\text{CN}$
- C  $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$
- D  $\text{CH}_3\text{CH}_2\text{NH}_2$

(Total 1 mark)

3. Which one of the following pairs of reagents reacts to form an organic product that shows only 2 peaks in its proton n.m.r. spectrum?

- A butan-2-ol and acidified potassium dichromate(VI)
- B ethanoyl chloride and methanol
- C propanoic acid and ethanol in the presence of concentrated sulphuric acid
- D ethene and hydrogen in the presence of nickel

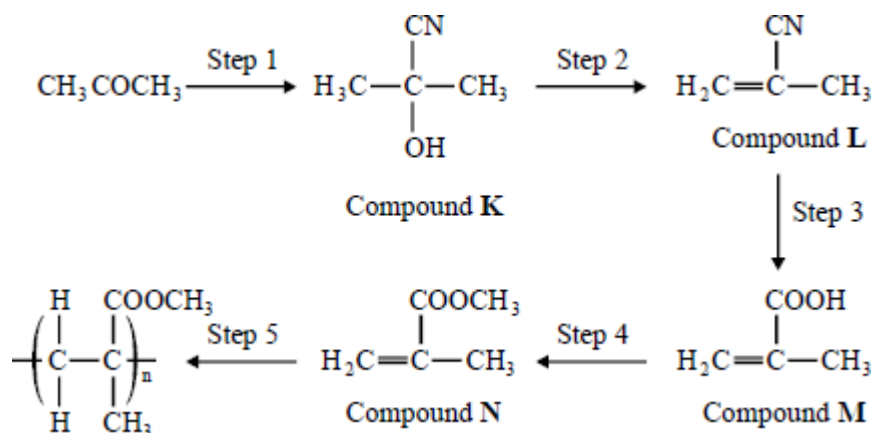
(Total 1 mark)

4. Which one of the following pairs reacts to form an organic product with only 2 singlets in its proton n.m.r. spectrum?

- A ethene and bromine
- B propan-2-ol and acidified potassium dichromate(VI)
- C ethanol and concentrated sulphuric acid
- D epoxyethane and water in the presence of dilute sulphuric acid

(Total 1 mark)

5. This question concerns the preparation of the plastic poly(methyl 2-methylpropanoate) (*Perspex*), starting from propanone.



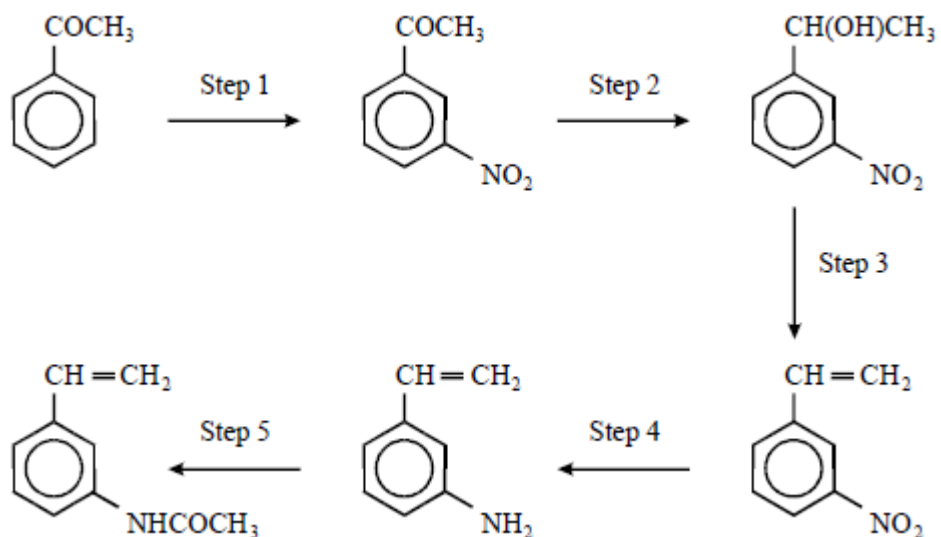
Which one of the following sets of reagents is **not** suitable for the step indicated?

- A Step 1 HCN (NaCN then dilute HCl)
- B Step 2 hot ethanolic KOH
- C Step 3 warm aqueous H<sub>2</sub>SO<sub>4</sub>
- D Step 4 CH<sub>3</sub>OH with an acid catalyst

(Total 1 mark)

**6.**

Refer to the following reaction sequence:



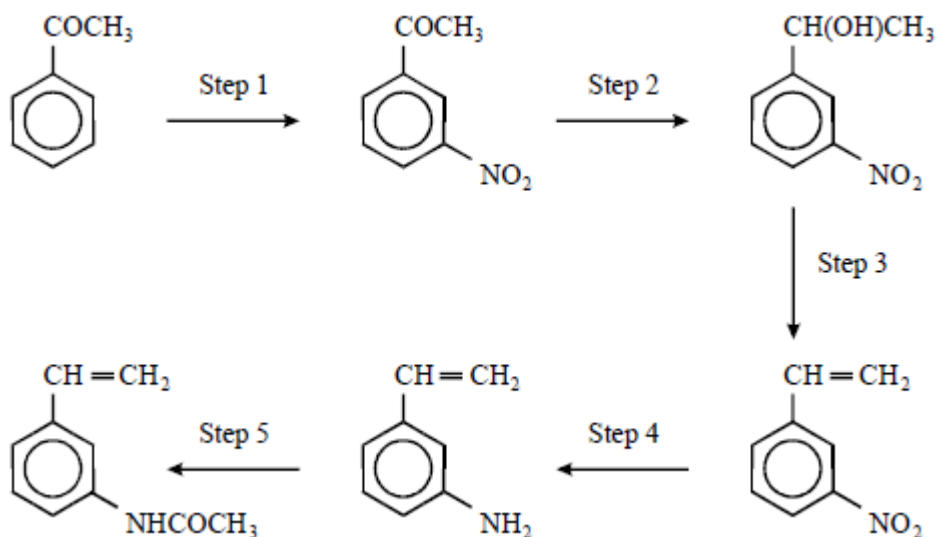
Which one of the following would be the most appropriate to carry out Step 2?

- A  $\text{H}_2 / \text{Ni}$
- B  $\text{Sn} / \text{HCl}$
- C  $\text{NaBH}_4$
- D  $\text{Fe} / \text{HCl}$

**(Total 1 mark)**

7.

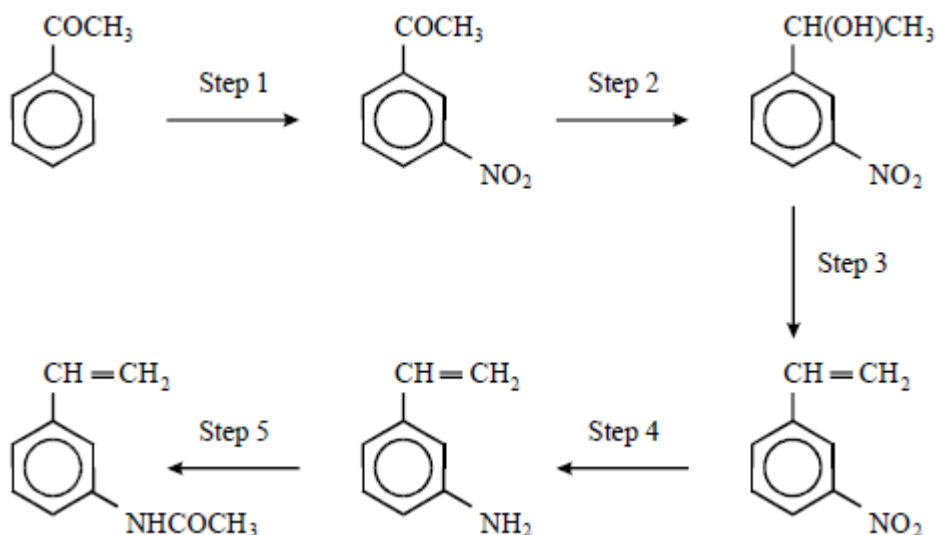
Refer to the following reaction sequence:

Which one of the following types of reaction mechanism is **not** involved in the above sequence?

- A electrophilic addition
- B electrophilic substitution
- C addition-elimination
- D elimination

(Total 1 mark)

8. Refer to the following reaction sequence:

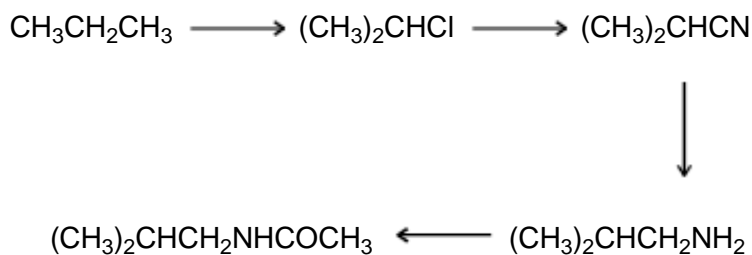


Which one of the following types of reaction is **not** involved in the above sequence?

- A acylation
- B oxidation
- C reduction
- D dehydration

(Total 1 mark)

9. Which one of the following types of reaction mechanism is **not** involved in the above sequence?

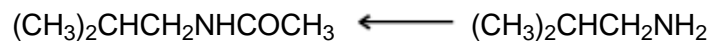
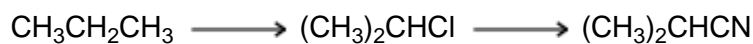


- A free-radical substitution
- B nucleophilic substitution
- C elimination
- D nucleophilic addition-elimination

(Total 1 mark)

10.

Which one of the following types of reaction is **not** involved in the above sequence?

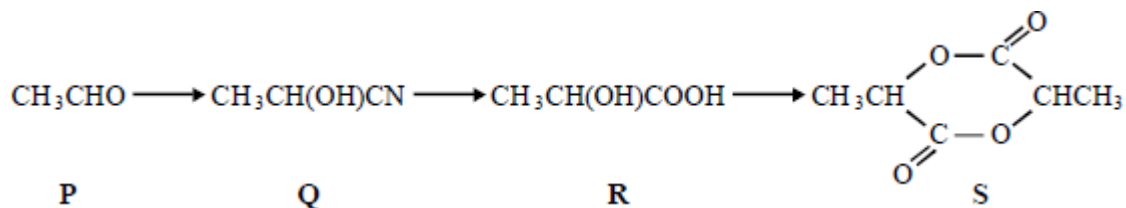


- A halogenation
- B acylation
- C reduction
- D oxidation

(Total 1 mark)

11.

This question refers to the reaction sequence below.



Which one of the following is **not** involved in the reaction sequence?

- A esterification
- B hydrolysis
- C nucleophilic addition
- D reduction

(Total 1 mark)