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CHEMISTRY

ORGANIC CHEMISTRY

Level & Board

AQA (A-LEVEL)

TOPIC:

INTRODUCTION TO ORGANIC CHEMISTRY

PAPER TYPE:

QUESTION PAPER - 4

TOTAL QUESTIONS

10

TOTAL MARKS

34

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Introduction to Organic Chemistry - 4

1. In the presence of ultraviolet light, methane and chlorine react to form a number of chlorine-containing products, including CH_2Cl_2 and CHCl_3

(a) Write an equation for the initiation step in the mechanism for this reaction.

(1)

(b) Write the overall equation for the formation of CHCl_3 from CH_2Cl_2 and Cl_2

(2)

(c) Write equations for the two propagation steps by which CH_2Cl_2 is converted into CHCl_3

(2)

(d) Suggest what effect increasing the intensity of the ultraviolet light would have on the rate of the reaction between methane and chlorine. Explain your answer.

(3)

2. Which compound has E–Z isomers?

- A. $\text{CH}_2=\text{CHBr}$
- B. $\text{CH}_2=\text{CBr}_2$
- C. $\text{CHBr}=\text{CHBr}$
- D. $\text{CBr}_2=\text{CHBr}$

(1)

3. Bromomethane, CH_3Br , can be formed by a reaction between bromine and methane.

The mechanism for this reaction is similar to the mechanism for the chlorination of methane.

(a) Name the mechanism for this reaction.

(1)

(b) Give the name of, and state an essential condition for, the first step in the mechanism for this reaction.

(1)

(c) Write an equation for a termination step in the mechanism for this reaction which gives ethane as a product.

(2)

(d) Bromomethane can undergo further substitution.

Write an overall equation for the reaction between bromomethane and bromine in which dibromomethane is formed.

(2)

4. Which is the correct general formula for non-cyclic compounds in the homologous series?

- A. alcohols $C_nH_{2n+2}O$
- B. aldehydes $C_nH_{2n+1}O$
- C. esters $C_nH_{2n+1}O_2$
- D. primary amines $C_nH_{2n+2}N$

(1)

5. Explain why ethanoyl chloride reacts readily with nucleophiles.

Write an equation for one nucleophilic addition–elimination reaction of ethanoyl chloride.

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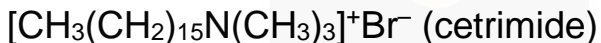
(4)

6. CH₂O is the empirical formula of

- A. methanol
- B. methyl methanoate
- C. ethane-1,2-diol
- D. butanal

(1)

7. Cetrимide is used as an antiseptic.



(a) Name this type of compound.

Give the reagent that must be added to CH₃(CH₂)₁₅NH₂ to make cetrимide and state the reaction conditions.

Name the type of mechanism involved in this reaction.

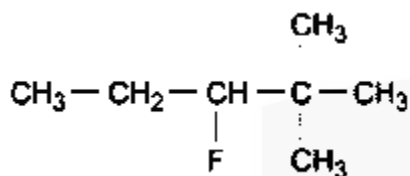
(4)

(b) Give a reagent that could be used in a test-tube reaction to distinguish between benzene and cyclohexene.

Describe what you would see when the reagent is added to each compound and the test tube is shaken.

(3)

8. What is the IUPAC name for this compound?



- A. 2-dimethyl-3-fluoropentane
- B. 2,2-dimethyl-3-fluoropentane
- C. 3-fluoro-2,2-dimethylpentane
- D. 3-fluoro-2-dimethylpentane

(1)

9. Decane has the molecular formula $\text{C}_{10}\text{H}_{22}$

(a) State what is meant by the term molecular formula.

(1)

(b) Give the molecular formula of the alkane which contains 14 carbon atoms.

(1)

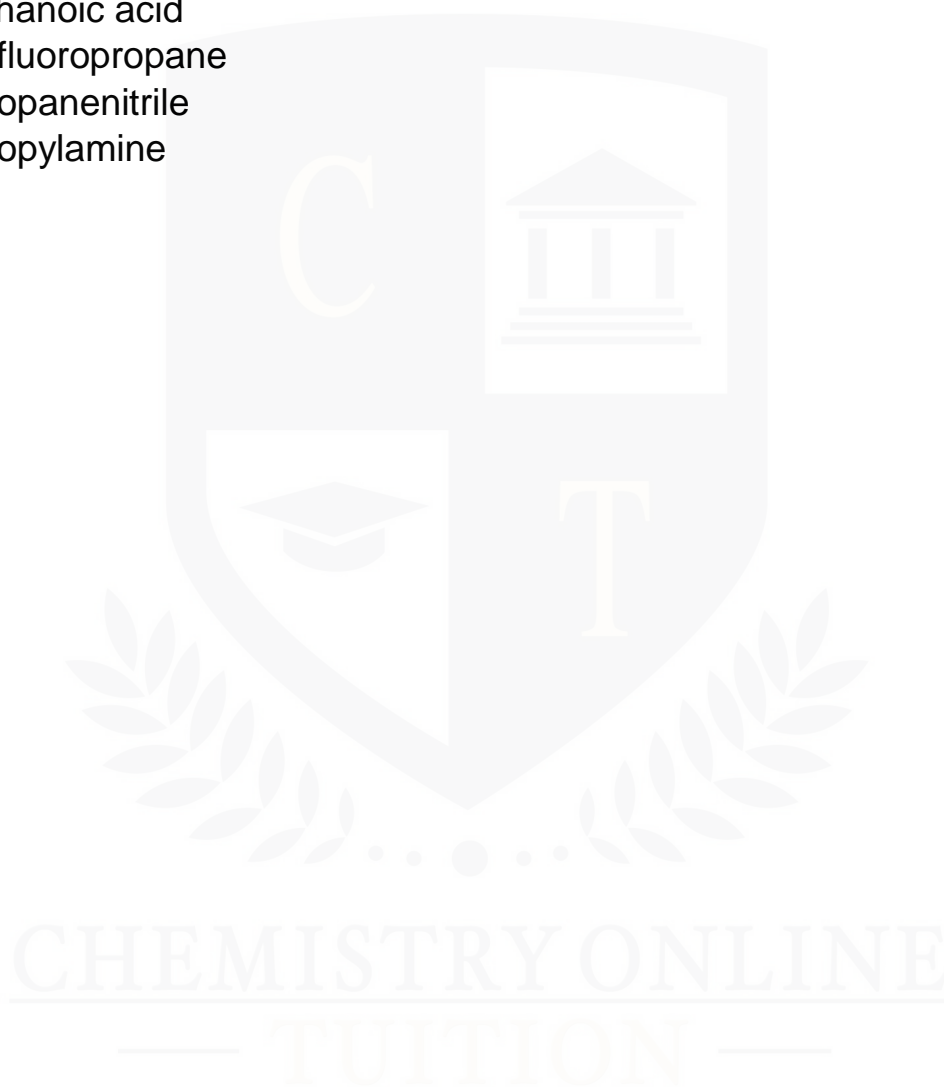
(c) Write an equation for the incomplete combustion of decane, $\text{C}_{10}\text{H}_{22}$, to produce carbon and water only.

(2)

10. Which compound has the lowest relative molecular mass?

- A. ethanoic acid
- B. 1-fluoropropane
- C. propanenitrile
- D. propylamine

(1)



I am Sorry !!!!!



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