

Organic: Test 1

Multiple choice (15 marks)

- Which one of the following formulae could represent an alkanal?
A. C_2H_4O B. $C_2H_4O_2$
C. C_2H_6 D. C_2H_6O
- Which one of the following formulae represents an ester?
A. H_3CCOOH B. H_3CCHO
C. H_3COCH_3 D. $HCOOCH_3$
- When the following aqueous solutions are arranged in order of increasing electrical conductivity (lowest conductivity first), what is the correct order?
i. 0.10 M NaOH
ii. 0.10 M CH_3CH_2OH
iii. 0.10 M CH_3COOH
A. i, ii, iii B. ii, i, iii
C. iii, ii, i D. ii, iii, i
- Which substance is expected to have the lowest boiling point?
A. CH_4 B. C_2H_2
C. $CHCl_3$ D. CH_3OCH_3
- When but-1-ene, $H_2C=CHCH_2CH_3$, reacts with bromine, the most likely product is
A. $H_3CCHBrCH_2CH_3$ B. $H_2C=CHCH_2Br$
C. $HBrC=CBrCH_2CH_3$ D. $H_2BrCCHBrCH_2CH_3$
- How many different isomers can be written for substances with the formula C_5H_{12} ?
A. 1 B. 2
C. 3 D. 5
- How many of the following compounds contain at least one C=O bond?
i. Ethanol
ii. Propanone
iii. Methylmethanoate
A. 0 B. 1
C. 2 D. 3

1. The combustion of a 5.048g sample of a compound of C, H, and O gave 7.406g CO₂ and 3.027g H₂O. Calculate the empirical formula of the compound. If the molecular mass is 30, What is its molecular formula? Show the possible structure(s) of this compound and name them. (4)

2. Select the substance with the higher boiling point in each of the following pairs. Explain your reasoning.

A. C₂H₆ and C₃H₈

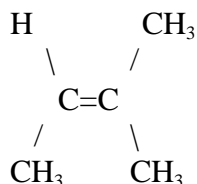
B. CH₃CH₂OH and CH₃OCH₃ (4)

3. C₂₀H₄₁OH is the formula of an alcohol. Dodecanol.

A. From your knowledge of chemistry, state and explain if the alcohol is likely to be a solid, liquid or gas at room temperature.

B. Dodecanol, C₂₀H₄₁OH, is only slightly soluble in water. Explain this property. (4)

4. A. For the addition of bromine to...



Name, and outline the mechanism of the reaction.

B. When hydrogen bromide reacts with the alkene in (A) above, there are two possible products. Give the structural formulas of the two products.

C. Give the structures of the two carbocations (carbonium ions) which could, in theory, be formed at the first stage of the reaction with HBr. Identify the major product and explain why it is formed in the larger amount. (10)

5. A. Distinguish between *Hydrogenation* and *hydration* of an organic compound.

B. Write one chemical equation to illustrate each reaction in 5 A. (3)