

Multiple Choice: Review Organic Questions

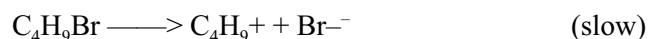
1. An appropriate set of conditions for converting 2-bromopropane into propene would be:

- A heating with ethanolic potassium hydroxide
- B heating with ethanolic ammonia
- C warming with aqueous silver nitrate
- D warming with aqueous sodium hydroxide

2. A warm solution of silver nitrate solution is added to a drop of 1-bromobutane in a test tube. What may be seen to happen?

- A A white precipitate quickly appears.
- B A layer of butan-1-ol covers the surface.
- C An off-white precipitate slowly appears
- D An intense yellow colouration appears.

3. The mechanism of alkaline hydrolysis of 2-bromo-2-methylpropane is thought to be:



Which of the following is evidence in favour of this mechanism ?

- A The rate of hydrolysis increases with temperature.
- B The rate of hydrolysis is proportional to $[\text{OH}^-]$
- C The reaction is zero order with respect to $[\text{OH}^-]$
- D The reaction is catalysed by $[\text{OH}^-]$

4. Benzene reacts with chlorine to give a substance with the formula $\text{C}_6\text{H}_6\text{Cl}_6$. This reaction is brought about by:

- A an acid catalyst
- B ultraviolet radiation
- C aluminium oxide
- D iron filings

5. When benzene reacts with concentrated sulphuric acid, benzene sulphonic acid, $\text{C}_6\text{H}_5\text{OSO}_2\text{H}$, is produced. This reaction is an example of:

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

6. Benzene reacts with a mixture of concentrated nitric and sulphuric acids to give nitrobenzene, $\text{C}_6\text{H}_5\text{NO}_2$. The electrophile in the mechanism of this reaction is:

- A NO_2
- B NO_2^-
- C NO_2^+
- D NO_2^-

7. Which of the following is *not* a piece of evidence for delocalisation of electrons in benzene?

- A benzene is more volatile than cyclohexene
- B all the C—C bond strengths are the same
- C all the bond lengths are identical
- D benzene is energetically more stable than expected

8. Benzene reacts with bromine in the presence of a catalyst to give bromobenzene, C_6H_5Br . Which of the following is the halogen carrier ?

- A aluminium oxide B platinum C iron(III) bromide D nickel

9. Which of the following **LEAST** affects the extent to which the plane of plane-polarised light is rotated by a solution of an optically active substance ?

- A the concentration of the solution B the molar mass of the substance
C the length of the light path D the wavelength of the light

10. In which of the following respects are the members of a pair of optical isomers **NOT** necessarily identical?

- A smell B infra-red spectrum C molecular formula D flammability

11. Which of the following is capable of cis-trans (geometrical) isomerism?

- A 1,1-dichloroethene B 1,2-dichloroethene
C 1,1,2,2-tetrachloroethene D 1,1,2-trichloroethene

12. Which of the following isomeric substances would be expected to have the lowest boiling point?

- A hexane B 2-methylpentane C 2,2-dimethylbutane D 3-methylpentane

13. Which of the following has a molecule with a chiral centre?

- A 2,3-dimethylbutane B 2-methylbutane
C 3-methylpentane D 2,3-dimethylpentane

14. Which of the following compounds does **NOT** have a chiral centre in its molecule?

- A insulin B nylon C maltose D glycogen

15. This question concerns the following organic reaction mechanisms. Select from A to D the mechanism by which ethane and chlorine would react in bright sunlight.

- A Electrophilic addition B Electrophilic substitution
C Free radical substitution D Nucleophilic substitution

16. Which of the following is a correct representation of the formula for the product of reaction between ethene and concentrated sulphuric acid?

- A $CH_3-CH_2-OSO_3H$ B $CH_3-CH_2-SO_3H$
C $CH_3-CH_2-SO_4H$ D $CH_3-CH_2-OSO_2H$

17. In the first step of the addition of hydrogen bromide to propene, $CH_3-CH=CH_2$, which of the following best describes what happens? A hydrogen atom attaches to:

- A the middle carbon atom and there is a positive charge on the CH_3- group.
B the right-hand carbon atom and there is a positive charge on the CH_3- group.
C the middle carbon atom and there is a positive charge on the $=CH_2$ group.
D the right-hand carbon atom and there is a positive charge on the middle carbon atom.

18. Limonene, which can be extracted from the coloured rind of citrus fruits, has a molecule with two double carbon-to-carbon bonds in it. Which of the following is **NOT** a correct description of the outcome of a reaction of limonene?

- A Limonene burns giving a mixture of products including carbon.
- B Limonene reacts exothermically with concentrated sulphuric acid.
- C One mole of hydrogen molecules reacts with 2 moles of limonene
- D One mole of limonene reacts with four moles of bromine atoms.

19. Alkenes, unlike alkanes, react with acidified potassium manganate(VII) solution. Which of the following best describes what happens? The colour changes from:

- A purple to colourless as oxidation takes place to give a diol
- B dark blue to colourless as oxidation takes place to give an aldehyde
- C pink to colourless as reduction takes place to give a carboxylic acid
- D orange to green as oxidation takes place to give a triol

20. Ethene molecules may be joined together in large numbers to form polymer molecules. Which of the following best describes this process?

- A electrophilic addition catalysed by acids
- B nucleophilic substitution catalysed by acids
- C addition reaction involving free radicals
- D substitution reaction catalysed by oxygen

21. Which of the following catalyses the reaction of an alkene with gaseous hydrogen?

- A an aluminium/nickel alloy
- B aluminium and sodium hydroxide
- C powdered aluminium
- D finely divided nickel

22. This question concerns the following organic reaction mechanisms. Select from A to D the mechanism by which bromoethane and aqueous sodium hydroxide react when heated together under reflux.

- A Electrophilic addition
- B Electrophilic substitution
- C Free radical substitution
- D Nucleophilic substitution

Multiple Choice Answer

- 1.A 2.C 3.C 4.B 5.A 6.C 7.A 8.C 9.B 10.A
11.B 12.C 13.D 14.B 15.C 16.A 17.B 18.C 19.A 20.C
21.D 22.D