

11. Organic Chemistry

1. Trend in fractions

- Viscosity increases as you go down
- Flammability decreases as you go down

2. What difference in molecules causes differences in physical properties of fractions?

Length of carbon chain

3. What does condensation mean, when forming polymers

Water is a product when the polymer is made

4. What is meant by the term unsaturated?

Not all the C-C bonds are single

5. Test for unsaturated compounds/ alkenes

- Add few drops of bromine water/ aqueous bromine
- Positive result: colour change from orange to colourless

6. Advantage of ethanol production by fermentation

Sugar/ glucose is renewable/sustainable

Another advantage: lower energy/temperature (or pressure)

7. Disadvantage of ethanol production by fermentation

Slower process

8. Addition reaction

only one product is formed / double bond becomes single bond / two molecules join to make one molecule

9. Observation when ethanoic acid is added to aqueous sodium carbonate

effervescence/fizzing/bubbling

10. Why is the disposal of nylon using landfill a problem?

non-biodegradable / running out of space / toxic / leaching

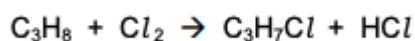
11. Define photochemical reaction

Reaction that occurs in the presence of light // Reaction whose rate is influenced by light

12. State the meaning of the term photochemical

Needs / uses ultraviolet light

13. Propane undergoes a substitution reaction with chlorine. Write the chemical equation for the reaction between one molecule of propane and one molecule of chlorine.



NOTE: carboxylic acid + alcohol \rightarrow ester + water

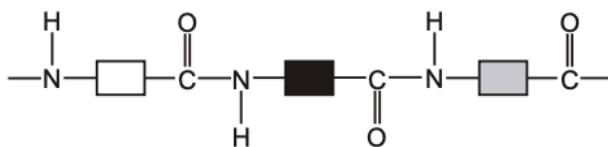
14. **Functional group**

the atoms / group of atoms which give any molecule its chemical properties // reactive part of an organic molecule

NOTE: when asked to name a polyester - Terylene

15.

The structure of a polymer is shown.



Which statements about the polymer are correct?

- 1 The polymer is nylon.
- 2 The polymer is formed by condensation polymerisation.
- 3 There are ester linkages between the monomers.

A 1 and 2 **B** 2 and 3 **C** 2 only **D** 3 only

Answer: C

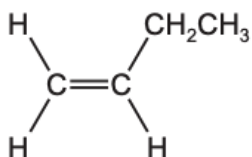
16. State the reagent & reaction conditions required to produce alcohol from an alkene

Reagent: steam

Reaction conditions

- Pressure: 60-70 atm
- Temperature: 300°C
- Catalyst: Conc. phosphoric acid

17. Suggest the name of the polymer formed from this monomer



poly(but-1-ene)

NOTE: ethanol is used as a fuel.

NOTE: remember to show continuation bonds at the ends when drawing a polymer.

18. Hydrolysis:

Chemical reaction that takes place when a polymer is converted back to its monomers

19.

The table shows the names or structures of organic compounds **P** to **U**.

P	Q	R
	propanoic acid	but-1-ene
S	T	U
propan-1-ol	methyl butanoate	

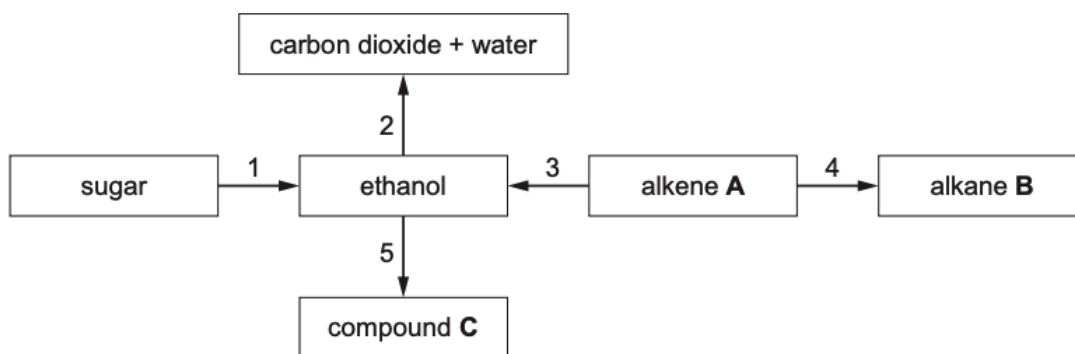
(a) Give the letters of the organic compounds, **P** to **U**, that are unsaturated hydrocarbons.

Answer: only R & U

**hydrocarbons = only carbon & hydrogen atoms

20.

The reaction scheme shows five organic reactions, numbered 1 to 5.



Name reaction 2

Complete combustion

State the type of reaction occurring during reaction 3

Addition

State the reagent and conditions for reaction 4

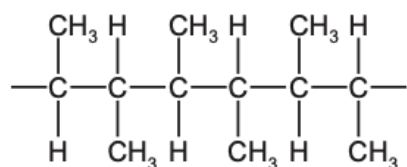
Reagent: hydrogen

Conditions:

- High temperature
- Catalyst

21.

Part of polymer **Z** has the structure shown.



Name the chemical process used to make the monomer which forms this polymer Z

Cracking

22. Ethane is an alkane which undergoes a photochemical reaction with chlorine. State why the reaction is described as a photochemical reaction.

- Needs ultraviolet light

23. Name the black solid produced when concentrated sulphuric acid is added to sugar (C₁₂H₂₂O₁₁)

Carbon

24. Name 2 types of substances that are used to break down proteins to amino acids

- Enzymes
- Acids

25. Give the name of the process that is used to produce amino acids from proteins

Hydrolysis

26. Identify the 2 functional groups present in the monomers used to produce synthetic polyamides

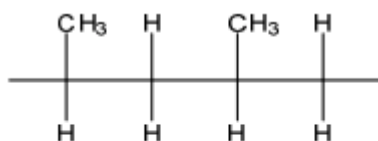
- Carboxylic acid
- Amine

27.

Complete the diagram to show a section of poly(propene).



Answer:



any one repeat unit (1)

both repeat units fully correct (1)

28. Why members of the same homologous series have same chemical properties

Same functional group

29. Propanoic acid reacts with aqueous sodium carbonate to form a salt

Suggest a name of the salt formed

Sodium propanoate

Suggest the formula of the anion in this salt

CH₃CH₂COO⁻

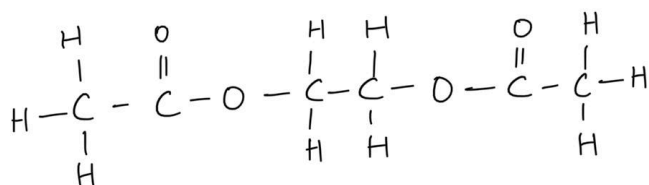
30. State the purpose of ultraviolet light in a photochemical reaction

Provides activation energy

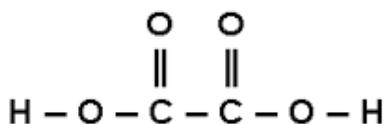
31. Give the structural formula of the product of the reaction between propene and chlorine



32. One molecule of ethane-1,2-diol will react with two molecules of ethanoic acid to form molecule X. X has two ester functional groups and a molecular formula of $\text{C}_6\text{H}_{10}\text{O}_4$. Draw the structure of X.



Each alcohol functional group in ethane-1,2-diol reacts with acidified potassium manganate(VII) to form a different organic compound, Y. Draw the structure or Y.



(ethanedioic acid)

33. Conditions required for fermentation of glucose

- Yeast
- Room temperature (25-35) and pressure
- Absence of air

34. Advantage of ethanol production by fermentation of yeast

Raw materials (glucose) are renewable

35. Advantage of ethanol production by catalytic addition of steam to ethene

High rate of reaction

36. Ethanoic acid reacts with calcium to form a salt and another product

Formula of the salt



Name the other product

Hydrogen

37. In terms of structure, state how one member of a homologous series differs from the next member

-CH₂- unit