

N5 Chemistry
Unit 2: Nature's Chemistry
Homework 2.4

1. What type of chemical reaction occurs when sulfuric acid reacts with sodium oxide? 5.

- A Neutralisation
- B Precipitation
- C Addition
- D Hydration

Answer _____

2. Which of the following substances has the smallest gram formula mass?

- A CO
- B CO₂
- C N₂
- D CH₄

Answer _____

3. In an exothermic reaction

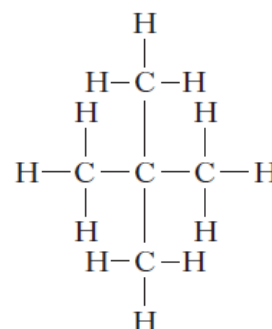
- A there is no energy change
- B energy is released to the surroundings
- C energy is absorbed from the surroundings
- D the energy of the products is greater than the energy of the reactants.

Answer _____

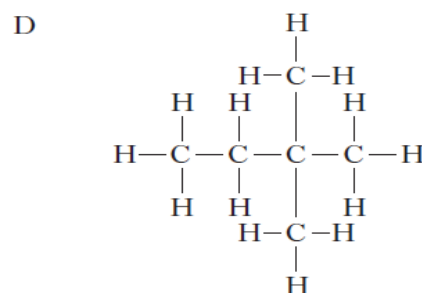
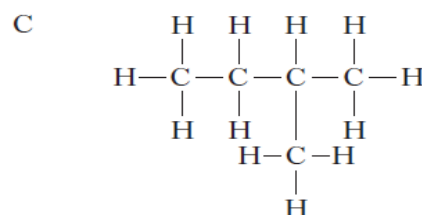
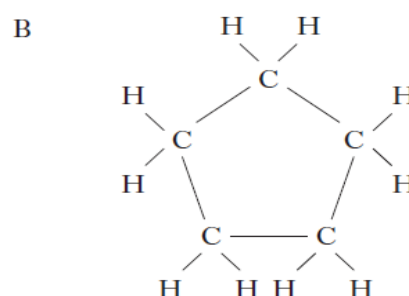
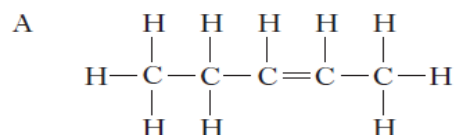
4. Which of the following would quickly decolourise bromine solution?

- A C₅H₁₂
- B C₄H₁₀
- C C₃H₈
- D C₂H₄

Answer _____



Which of the following compounds is an isomer of the one shown above?



6. An antibacterial hand gel contains two alcohols, ethanol and propan-1-ol.

a) Draw the full structural formula for ethanol and propan-1-ol.

2

b) The alcohols are a homologous series containing carbon, hydrogen and oxygen.

i) State the general formula for the alcohols.

1

ii) State what is meant by a homologous series.

1

c) The boiling point of ethanol is 78°C and the boiling point of propan-1-ol is 97°C.

Explain why the boiling point of the alcohols increases with increasing size of molecule.

1

d) Ethanol is produced by the fermentation of glucose.

i) Name the gas produced during the fermentation of glucose.

1

ii) Name the process used to increase the ethanol concentration of fermentation products.

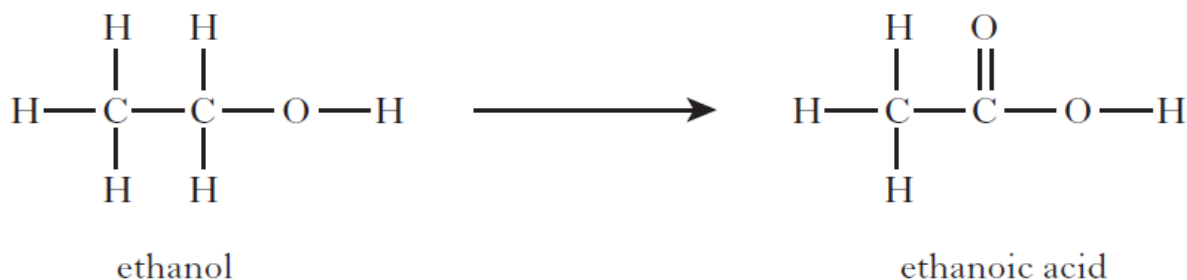
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e) Name an isomer of propan-1-ol.

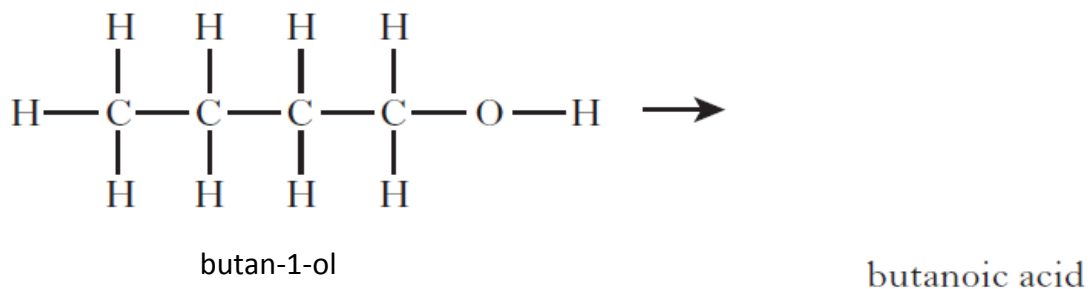
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6. (continued)

- f) When certain alcohols are "oxidised" carboxylic acids are produced.



Draw the full structural formula for the carboxylic acid produced when butan-1-ol is oxidised.



1

- g) Esters are produced when alcohols react with carboxylic acids.

The table gives information on esters.

Alcohol	Carboxylic Acid	Ester
methanol	ethanoic acid	methyl ethanoate
ethanol	propanoic acid	ethyl propanoate
propanol	methanoic acid	propyl methanoate
butanol	ethanoic acid	butyl ethanoate
pentanol	butanoic acid	X

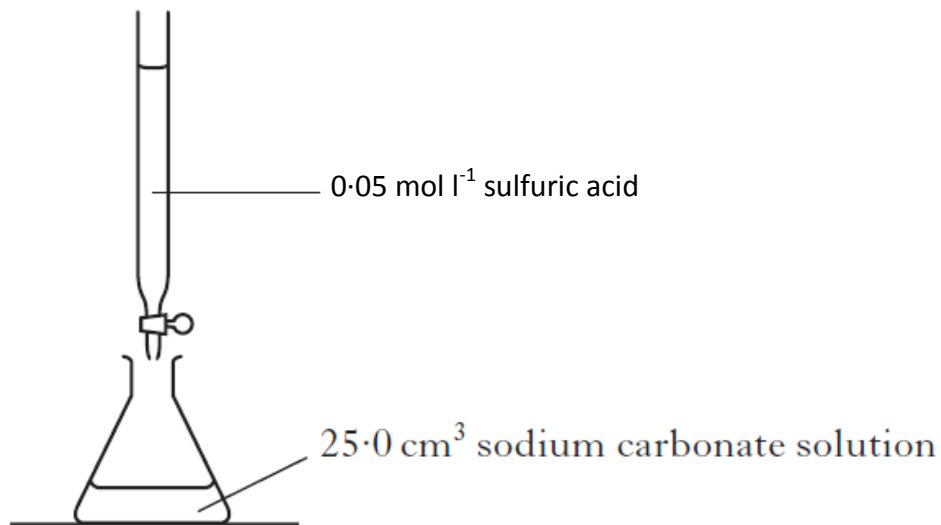
- i) Suggest a name for ester X.

1

- ii) Give two uses for esters.

1

7. A student was trying to determine the concentration of sodium carbonate solution by titrating with sulfuric acid.



The results showed that 20 cm³ of sulphuric acid was required to neutralise the sodium carbonate solution.

- a) What must be added to the conical flask to allow the end point to be detected?

_____ 1

- b) Calculate the number of moles of sulfuric acid used in this titration.

_____ moles 2

- c) One mole of sulfuric acid reacts with one mole of sodium carbonate.
Using your answer to part b) calculate the concentration, in mol l⁻¹, of the sodium carbonate solution.

_____ mol l⁻¹ 2

Total Marks 21