

N5 Chemistry
Unit 2: Nature's Chemistry
Homework 2.7

1. In a reaction, 60 cm³ of hydrogen gas was collected in 20 s.

What is the average rate of reaction, in cm³ s⁻¹, over this time?

- A $\frac{60}{20}$
 B $\frac{20}{60}$
 C $\frac{1}{60}$
 D $\frac{1}{20}$

Answer _____

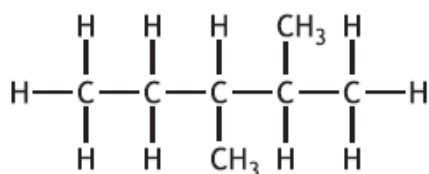
2. 0.2 mol of a gas has a mass of 12.8 g.

Which of the following could be the molecular formula for the gas?

- A SO₂
 B CO
 C CO₂
 D NH₃

Answer _____

- 3.



The name of the above compound is

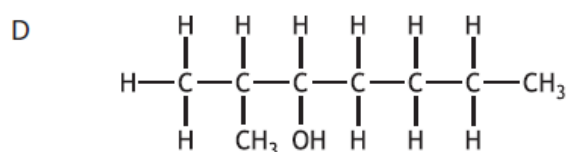
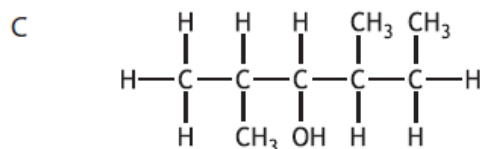
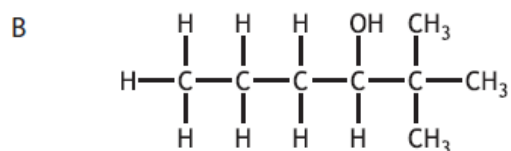
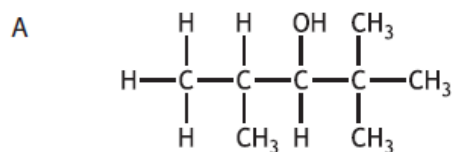
- A 2,3-dimethylpropane
 B 3,4-dimethylpropane
 C 2,3-dimethylpentane
 D 3,4-dimethylpentane.

Answer _____

4. The shortened structural formula for an organic compound is



Which of the following is another way of representing this structure?



Answer _____

5. Which compound would **not** neutralise hydrochloric acid?

- A Sodium carbonate
 B Sodium chloride
 C Sodium hydroxide
 D Sodium oxide

Answer _____

6. Butter contains different triglyceride molecules.

a) A triglyceride molecule is made when the alcohol glycerol reacts with carboxylic acids.

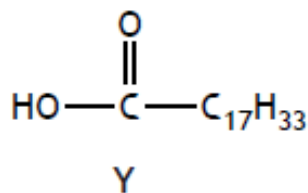
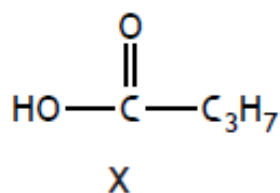
i) Name the functional group present in glycerol.

1

ii) Name the family to which triglycerides belong.

1

b) When butter goes off, a triglyceride molecule is broken down, producing compounds X and Y.



i) Name compound X. _____

1

ii) Describe the chemical test, including the result, to show that compound Y is unsaturated.

1

7. Liquefied petroleum gas (LPG), which can be used as a fuel for heating, is a mixture of propane and butane.

a) Propane and butane are members of the homologous series of alkanes.

Tick (✓) the **two** boxes that correctly describe members of the same homologous series.

2

	Tick (✓)
They have similar chemical properties.	<input type="checkbox"/>
They have the same molecular formula.	<input type="checkbox"/>
They have the same general formula.	<input type="checkbox"/>
They have the same physical properties.	<input type="checkbox"/>
They have the same formula mass.	<input type="checkbox"/>

7. b) The table gives some information about propane and butane.

<i>Alkane</i>	<i>Boiling Point (°C)</i>
propane	-42
butane	-1

Explain why butane has a higher boiling point than propane.

1

- c) 25 kg of water at 10°C is heated by burning some LPG. Calculate the energy, in kJ, required to increase the temperature of the water to 30 °C.

You may wish to use the data booklet to help you.

3

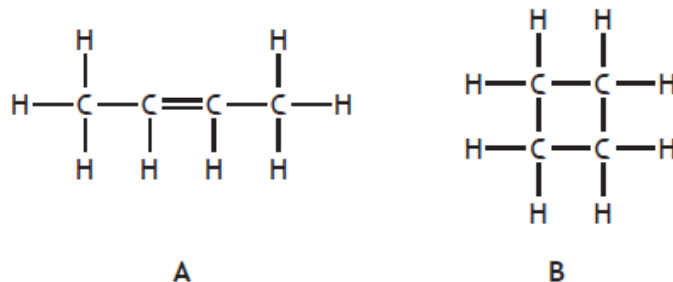
Show your working clearly.

- d) LPG is odourless. In order to detect gas leaks, ethyl mercaptan, C₂H₆S, a smelly gas, is added in small quantities to the LPG mixture.

Suggest one disadvantage of adding sulfur compounds, such as ethyl mercaptan, to fuels such as LPG.

1

8. The structural formulae of two hydrocarbons are shown.



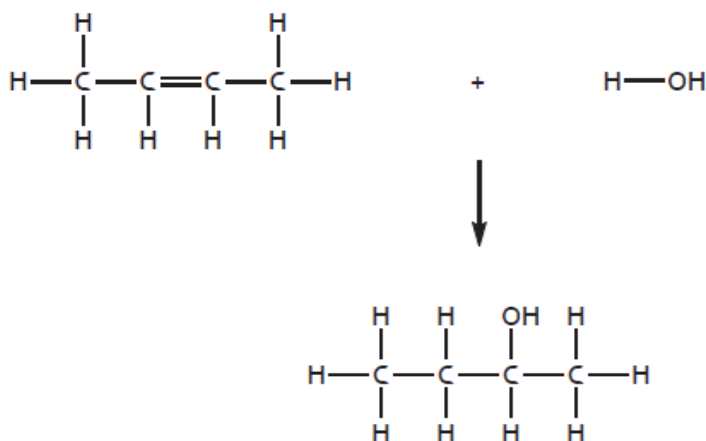
a) Name hydrocarbon A.

_____ 1

b) Hydrocarbons A and B can be described as isomers. State what is meant by the term isomer.

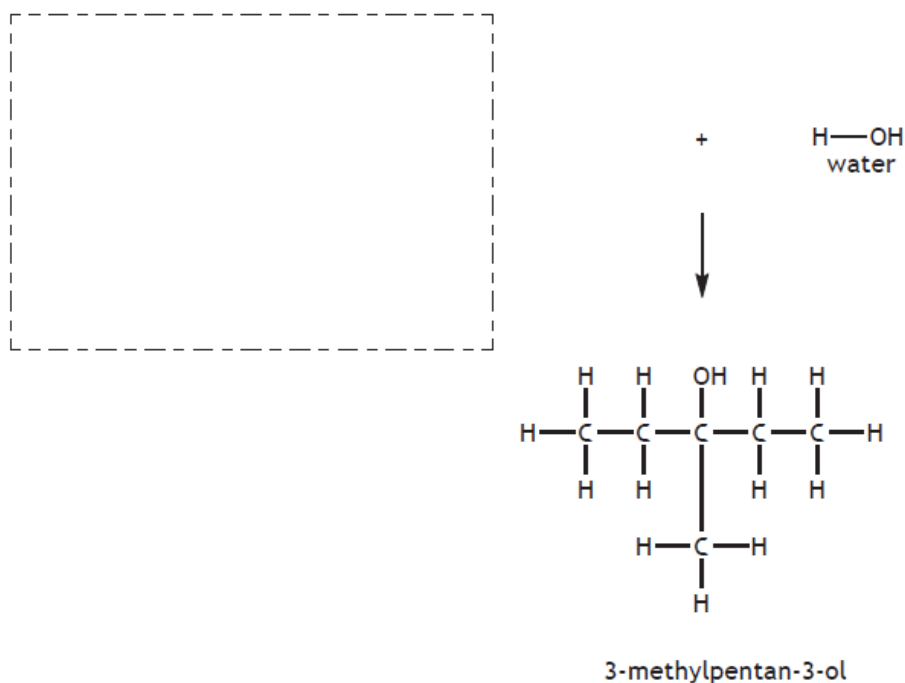
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c) Hydrocarbon A can undergo an addition reaction with water to form butan-2-ol as shown.



A similar reaction can be used to produce 3-methylpentan-3-ol. Draw a structural formula for the hydrocarbon used to form this molecule.

1



Total marks 19