

Unit 2

Hydrocarbons

Go to question

- 1 What type of reaction takes place when butene is formed from butane?
- 2 When propyne reacts with chlorine, how many possible compounds could be formed?
- 3 The structural formula for 2,4-methylpent-2-ene is
- 4 Which of the following compounds contribute to the destruction of the ozone layer?
- 5 What is the main constituent of biogas?
- 6 Branched chain hydrocarbons are added to petrol because?
- 7 Changing long chain hydrocarbons into branch chains and aromatic hydrocarbons is called?
- 8 Which biofuel can be produced by the fermentation of plant matter?



1 What type of reaction takes place when butene is formed from butane?

a. Hydrolysis

b. Dehydrogenation

c. Hydrogenation

d. Dehydration



a hint!!!!

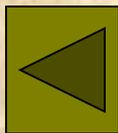
1st hint

C_4H_8 is the formula for butene, so what has butane lost?



2nd hint

Hydrogen has been removed from butane.



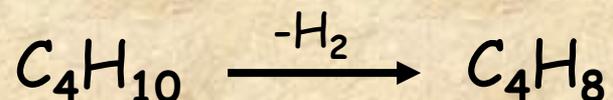
3rd hint

"De" refers to the removal of something.



What type of reaction takes place when butene is formed from butane?

Correct because.....



Dehydrogenation means the removal of hydrogen

Dehydration means the removal of water

Hydrogenation means the addition of hydrogen

Hydrolysis means to react (split up) using water



2 When propyne reacts with hydrogen chloride, how many possible compounds could be formed?

a. 2

b. 3

c. 4

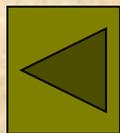
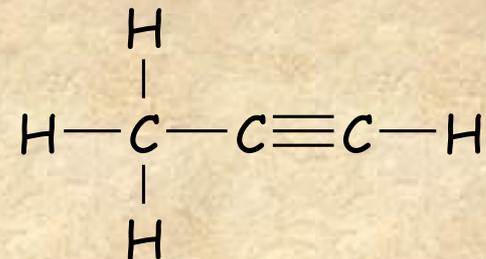
d. 5



a hint!!!!

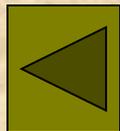
1st hint

The structural formula for propyne

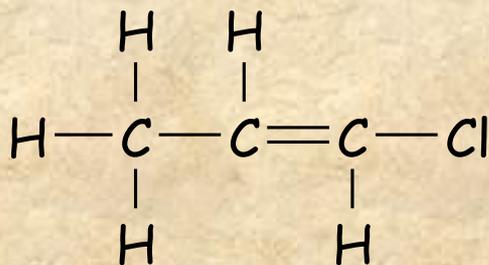
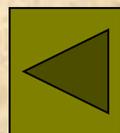


2nd hint

What happens when chlorine reacts with the C triple bond?



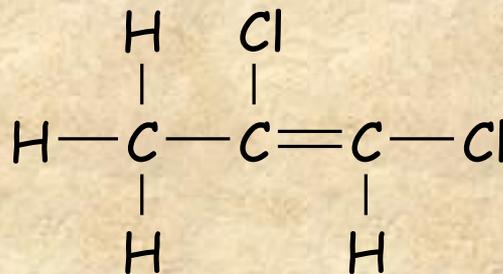
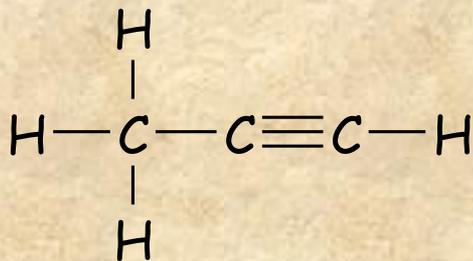
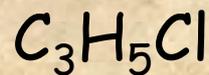
3rd hint



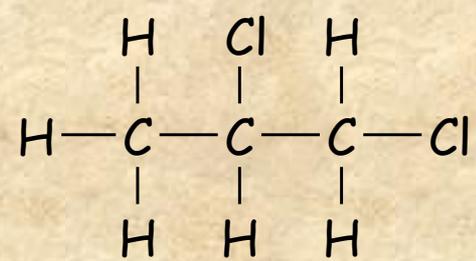
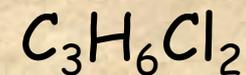
When propyne reacts with chlorine, how many possible compounds could be **formed**?

5 Correct because.....

C_3H_4 is the molecular formula for propyne.



2 possibilities

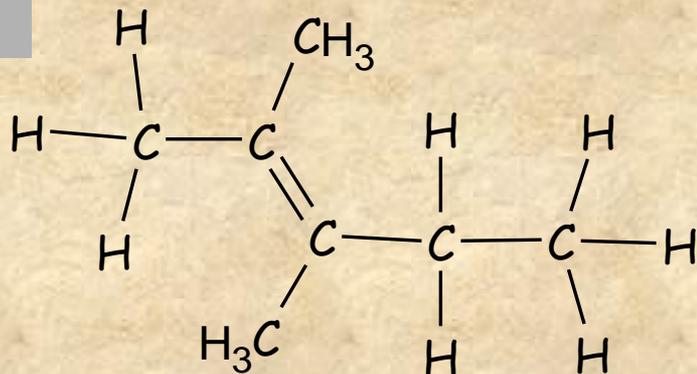


3 possibilities

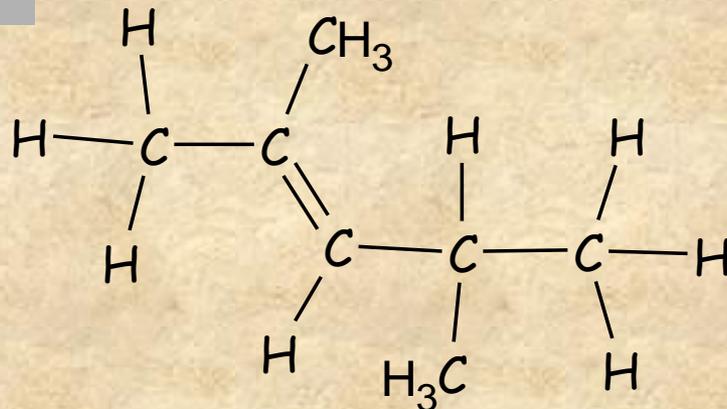


3 The structural formula for 2,4-dimethylpent-1-ene is

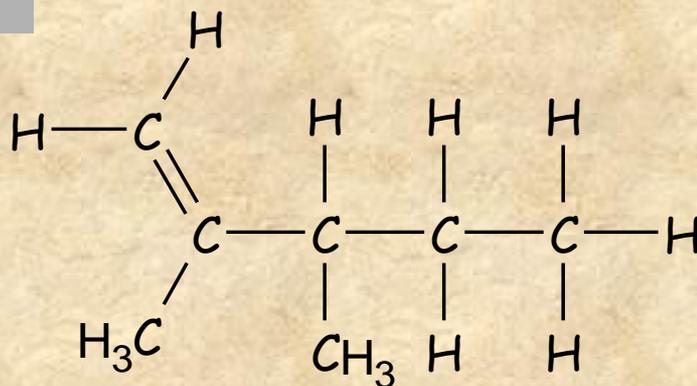
a.



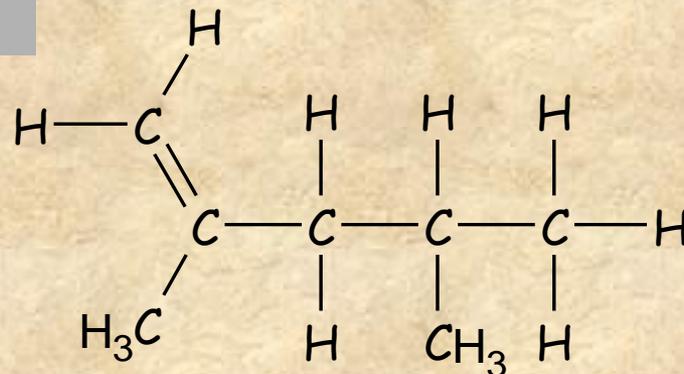
b.



c.

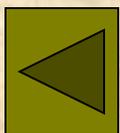


d.



a hint!!!!

Check the position of the methyl groups, CH_3

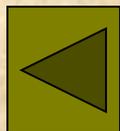


a hint!!!!

1st hint

The 1-ene marks the position of the C=C

1 2



2nd hint

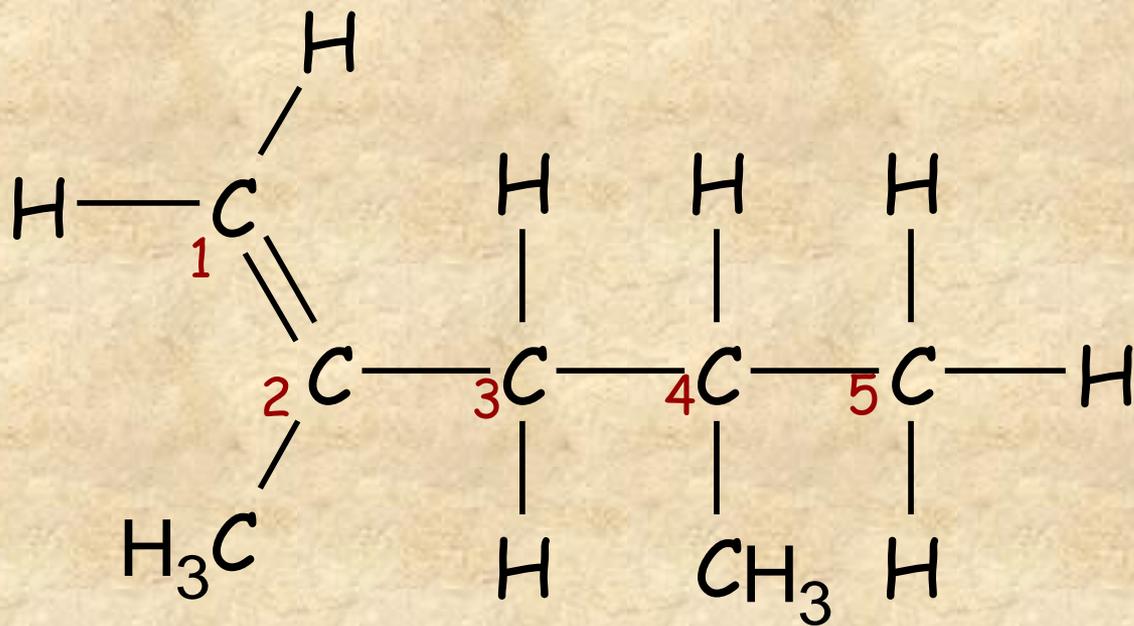
Check the position of the methyl groups, CH₃



The structural formula for 2,4-dimethylpent-1-ene is

Correct because.....

d



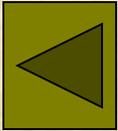
4 Which of the following compounds contribute to the destruction of the ozone layer?

- a. Hydrocarbons
- b. Chlorofluorocarbons
- c. Oxides of nitrogen
- d. Oxides of carbon



a hint!!!!

Which one has a halogen in its structure?



Which of the following compounds contribute to the destruction of the ozone layer?

Correct because.....

Chlorofluorocarbons (CFC's) can reach the stratosphere. Here, UV radiation attacks the CFC's forming **free radicals** which, in turn, break down ozone.



5 What is the main constituent of biogas?

a. Carbon monoxide and hydrogen

b. Butane

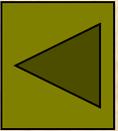
c. Methane

d. Propane



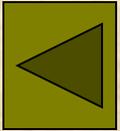
a hint!!!!

This is synthesis gas, this is made from methane!!



a hint!!!!

This gas comes from the fractional distillation of crude oil.



What is the main constituent of biogas?

Correct because.....

Methane

Methane, produced by anaerobic respiration, is known as biogas. Decomposing plant matter and animal waste are sources of biogas.



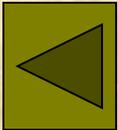
6 Branched chain hydrocarbons are added to petrol because they?

- a. They are cheaper to produce.
- b. They stop petrol from evaporating too quickly
- c. They allow the petrol to burn better.
- d. They reduce the octane number of petrol.



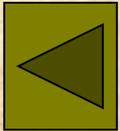
a hint!!!!

Branched chain hydrocarbons are made by reforming straight chain hydrocarbons



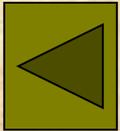
a hint!!!!

In what state does petrol have to be before it burns?



a hint!!!!

Octane rating is a measure of the quality of petrol!!

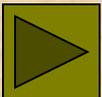


Branched chain hydrocarbons are added to petrol because?

Correct because.....

They allow the petrol to burn better. Branching increases the octane rating of the fuel.

When blended into petrol, the higher octane numbered products suffer from less 'knocking' in the engine.



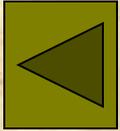
7 Changing long chain hydrocarbons into branch chains and aromatic hydrocarbons is called..

- a. Hydrogenation
- b. Reforming
- c. Fractional distillation
- d. Fermentation



a hint!!!!

This involves the reaction of hydrogen, e.g. ethene to ethane involves hydrogen as a reactant.



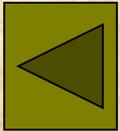
a hint!!!!

This process involves the separation of a mixtures of liquids.



a hint!!!!

This is a biological process which produces carbon dioxide and ethanol.



Changing long chain hydrocarbons into branch chains and aromatic hydrocarbons is called?

Correct because.....

Reforming is a chemical process which changes the molecular structure of the alkane.

There are several different reforming processes. Each one uses heat, pressure and various catalysts.





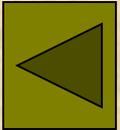
Which biofuel can be produced by the fermentation of plant matter?

- a. Biodiesel
- b. Hydrogen
- c. Methanol
- d. Ethanol



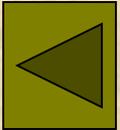
a hint!!!!

Biodiesel is a renewable fuel produced from oil extracted from plants. This is then mixed with methanol in the presence of KOH.



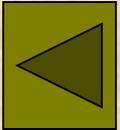
a hint!!!!

Hydrogen is produced by either electrolysis of water, from methane or C_6H_{14} obtained from the fraction, naphtha.



a hint!!!!

Methanol is manufactured by the catalytic hydrogenation of carbon monoxide.



Which biofuel can be produced by the fermentation of plant matter?

Correct because.....

Ethanol

Produced by fermentation, it has an octane rating of 111. Brazil use sugar cane to produce ethanol by fermentation. The fermentation mixture has to be distilled to obtain a purer form of ethanol. A mixture of petrol and ethanol is called 'gasohol'

