

# CAIE Chemistry IGCSE

## 11.1 Formulae, functional groups and terminology

### Flashcards

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What type of compound has the  
molecular formula  $C_2H_4$ ?



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Alkene

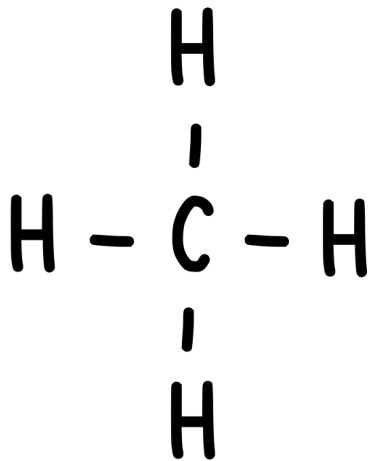
$C_2H_4$  is the molecular formula for ethene.



Draw the displayed formula for the compound with the molecular formula  $\text{CH}_4$ ?



Draw the displayed formula for the compound with the molecular formula  $\text{CH}_4$



What type of compound has the  
molecular formula  $C_3H_6O_2$ ?



What type of compound has the molecular formula  $C_3H_6O_2$ ?

Carboxylic acid

$C_3H_6O_2$  is propanoic acid



Draw the displayed formula for the compound with the molecular formula  $\text{CH}_3\text{COOH}$ ?







# What is a homologous series?



# What is a homologous series?

A family of similar compounds with similar chemical properties due to the presence of the same functional group.



# What is a general formula?



## What is a general formula?

The general formula is a formula followed by all the compounds in the same homologous series representing the composition of the atoms present in each molecule



What are the general formulas for alkanes and alkenes?



What are the general formulas for alkanes and alkenes?

Alkanes:  $C_n H_{2n+2}$

Alkenes:  $C_n H_{2n}$



# What are the general formulas for alcohols?





What are the general formulas for alcohols?

Alcohols:  $C_n H_{2n+1} OH$



What are the general formulas for  
carboxylic acids?



What are the general formulas for carboxylic acids?

Carboxylic acids:  $C_n H_{2n+1} COOH$



# What is a functional group?



# What is a functional group?

The functional group is an atom or group of atoms that determine the chemical properties of a homologous series



What's the difference between saturated and unsaturated compounds?



What's the difference between saturated and unsaturated compounds?

Saturated - only contain single carbon-carbon bonds.

Unsaturated - contain at least one double carbon-carbon bond.



What does the structural formula show?  
(extended only)





What does the structural formula show? (**extended only**)

The structural formula is a formula which shows the arrangement of atoms in the molecule of a compound but does not show all the bonds between them.



# What is structural isomerism? (extended only)



## What is structural isomerism? (extended only)

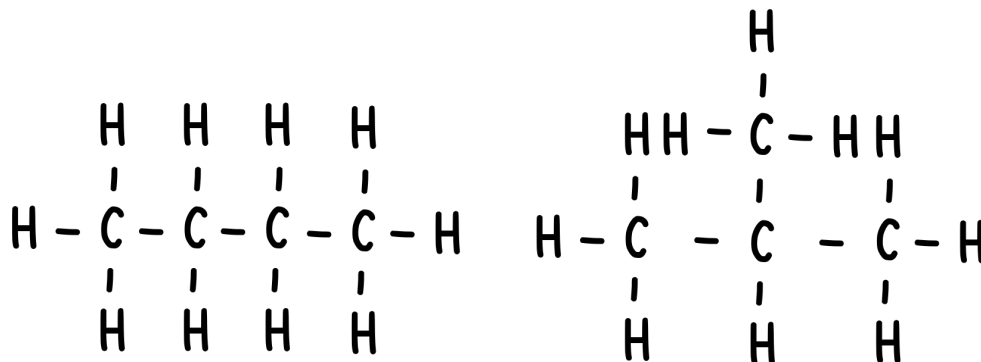
Structural isomerism is when compounds have the same molecular formula but a different arrangement of atoms.



Draw the two structural isomers of  $C_4H_{10}$   
(extended only)



Draw the two structural isomers of  $C_4H_{10}$  (extended only)



butane



2-methylpropane

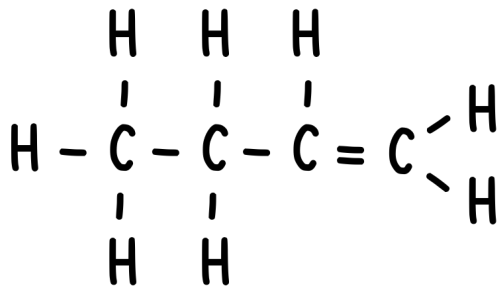
Both isomers have molecular formula  $C_4H_{10}$



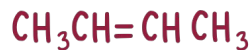
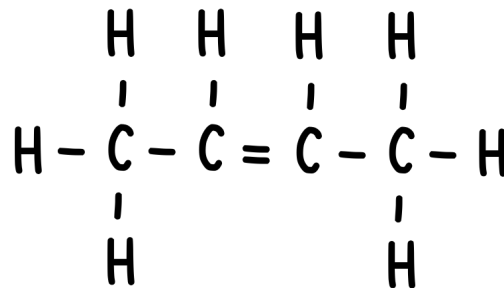
Draw the two structural isomers of  $C_4H_8$   
(extended only)



Draw the two structural isomers of  $C_4H_8$  (extended only)



but-1-ene



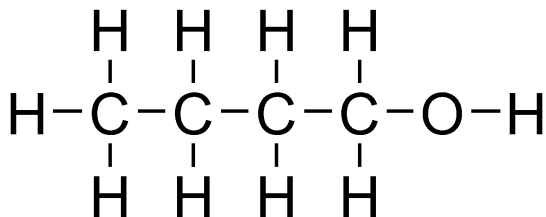
but-2-ene

Both isomers have molecular formula  $C_4H_8$

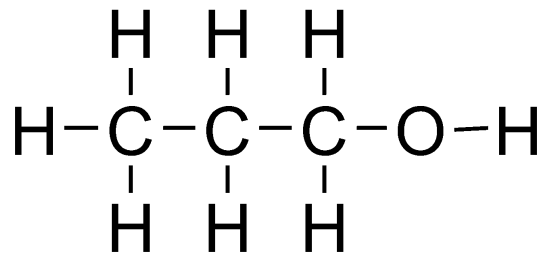


Which of the following compounds show structural isomerism? (extended only)

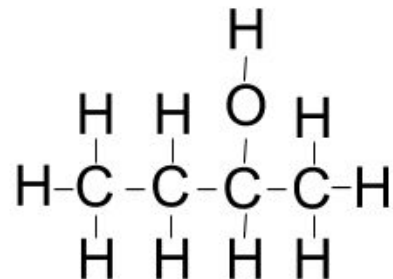
1.



2.



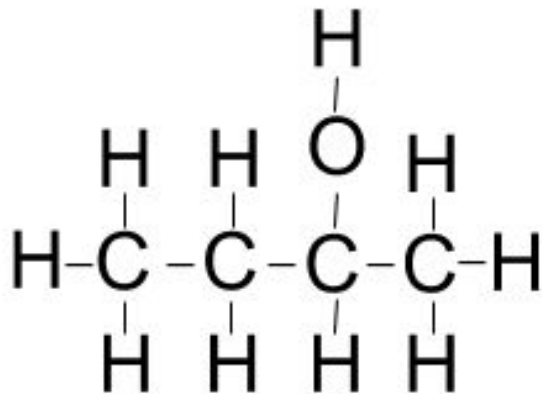
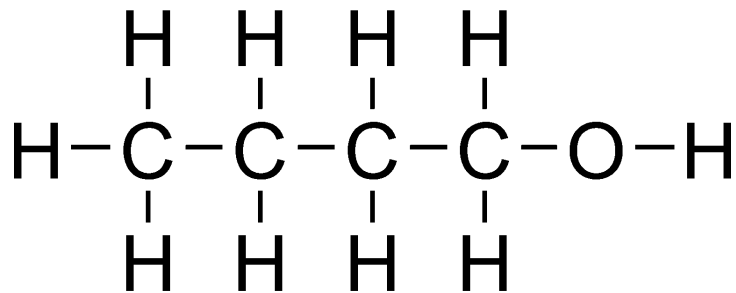
3.





Which of the following compounds show structural isomerism? (**extended only**)

1 and 3 are structural isomers



What are the general characteristics of a homologous series?  
(extended only)



What are the general characteristics of a homologous series? (extended only)

- Have the same functional group
- Have the same general formula
- Differ from one member to the next by a  $-\text{CH}_2-$  unit
- Display a trend in physical properties
- Share similar chemical properties

