

11.1 Formulae, functional groups and terminology

Name: _____ Class: _____ Date: _____

Total: 8 marks

Objective

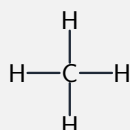
Build the skills to answer exam questions on **formulae, functional groups and terminology** 有机化学术语—types of formula, the **homologous series** 同系物, saturated/unsaturated, and **structural isomers** 同分异构体.

You must be able to:

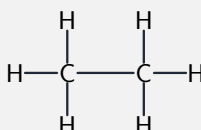
- use molecular, displayed, structural and general formulae
- describe a homologous series and its general formula
- recognise saturated/unsaturated and structural isomers

1 Worked examples

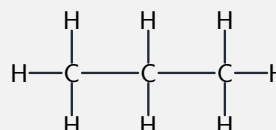
■ Homologous series & isomers



methane
 CH_4



ethane
 C_2H_6



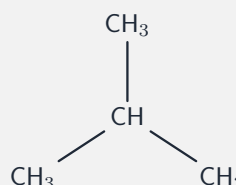
propane
 C_3H_8

each step adds a CH_2 unit general formula $\text{C}_n\text{H}_{2n+2}$

A homologous series: same functional group, differ by CH_2 , general formula $\text{C}_n\text{H}_{2n+2}$ for alkanes



butane (straight chain)



2-methylpropane (branched)

both have the formula C_4H_{10} : same formula,

different structure (structural isomers)

Structural isomers: same molecular formula, different structures

2 Practice

2.1 State the general formula of the alkanes. [1]

2.2 Define a structural isomer. [1]

3 Exam-style questions

3.1 A saturated hydrocarbon contains: [1]

- **A** a C=C double bond
 - **B** only single C–C bonds
 - **C** an –OH group
 - **D** a –COOH group
-

3.2 Members of a homologous series have similar chemical properties.

(a) State why they have similar chemical properties. [1]

(b) State how consecutive members differ. [1]

3.3 Draw the two structural isomers of C₄H₁₀ and name each. [3]

4 Go further

You are now ready for the real exam questions on this subtopic. Open the **11.1 Formulae, functional groups and terminology** past-paper sheet in the Library, or try

these in **Practice mode**:

- 0620/22 N25 —Q34 (organic terminology)
- 0620/23 N25 —Q37 (homologous series / isomers)

Solutions

2.1 C_nH_{2n+2} .

2.2 compounds with the same molecular formula but different structural formulae.

3.1 B. A saturated hydrocarbon has only single C–C bonds.

3.2 (a) they have the same functional group.

(b) by a CH_2 unit each step.

3.3 straight chain butane $CH_3CH_2CH_2CH_3$; branched 2-methylpropane; both named correctly.