

14.3 Homologous Series

Question Paper

Level	IGCSE
Subject	Chemistry (0620)
Exam Board	Cambridge International Examinations (CIE)
Topic	Organic Chemistry
Sub-Topic	14.3 Homologous Series
Booklet	Question Paper

Time Allowed: 18 minutes

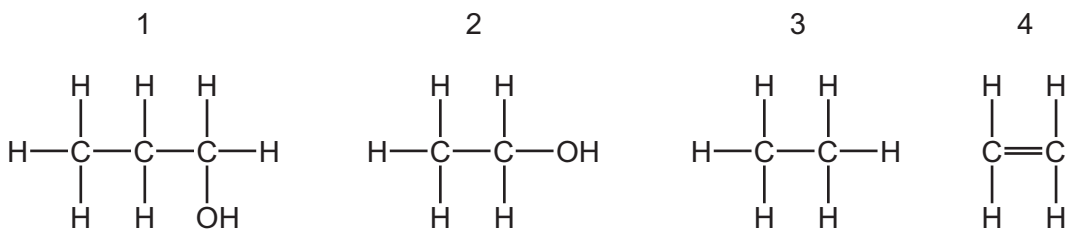
Score: /15

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%

1 The structures of four molecules are shown.



Which molecules belong to the same homologous series?

- A** 1 and 3 **B** 1 and 2 **C** 2 and 4 **D** 3 and 4

2 The main constituent of natural gas is hydrocarbon X.

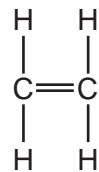
To which homologous series does X belong and how many **atoms** are in one molecule of X?

	homologous series	number of atoms in one molecule
A	alkane	1
B	alkane	5
C	alkene	1
D	alkene	5

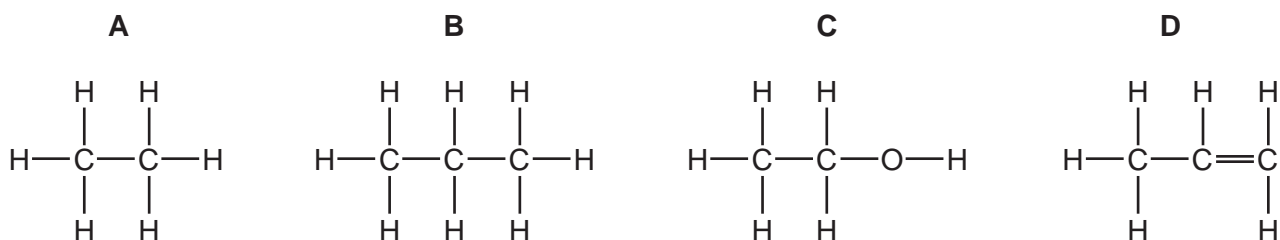
3 In which reaction could one of the products belong to the same homologous series as the organic reactant?

- A** addition of steam to ethene
B combustion of an alkane
C cracking of an alkane
D polymerisation of ethene

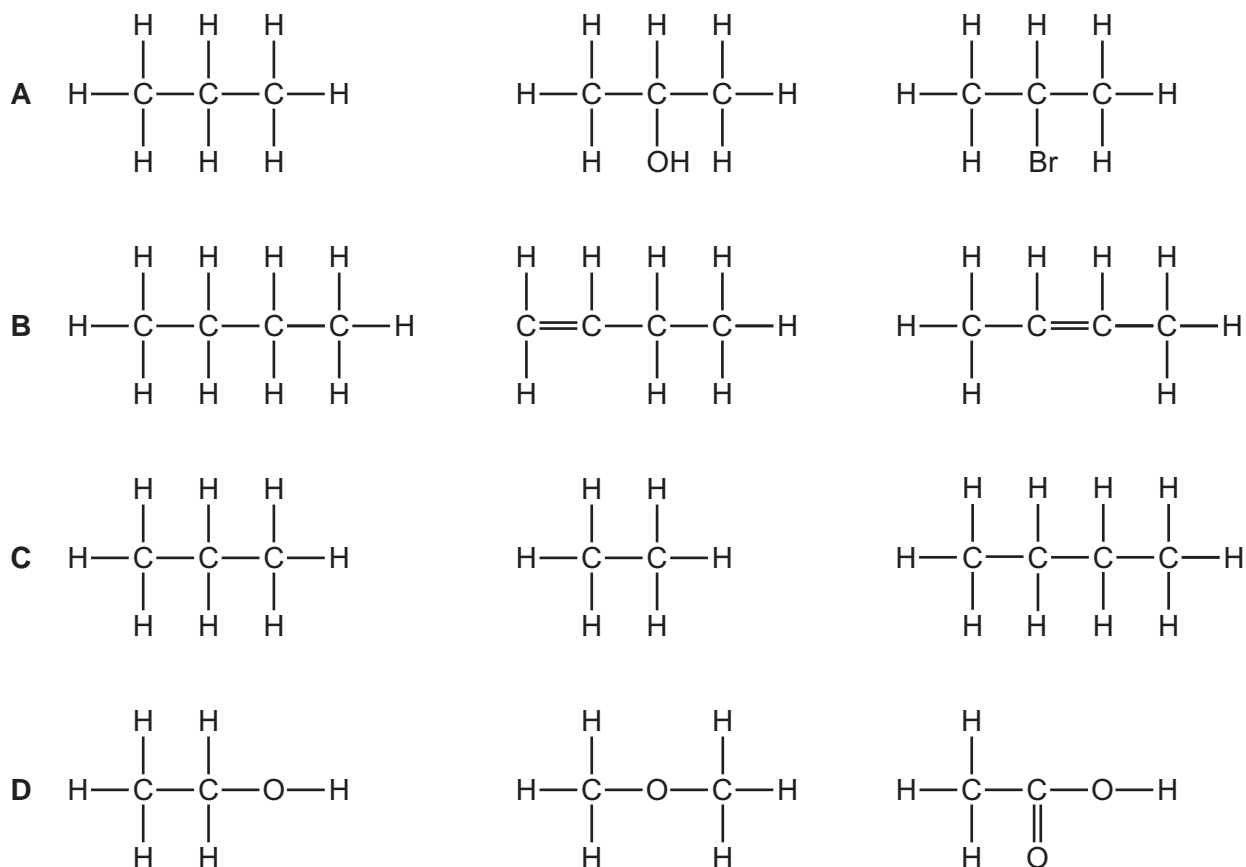
4 The diagram represents ethene.



Which compound has chemical properties similar to those of ethene?



5 Which row represents compounds in the same homologous series?



6 A hydrocarbon X is cracked to make Y and hydrogen.

Compound Z is formed by the addition polymerisation of Y.

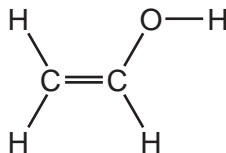
To which homologous series do X, Y and Z belong?

	alkane	alkene
A	X, Y and Z	–
B	X and Y	Z
C	X and Z	Y
D	Y and Z	X

7 Which group of compounds is part of a homologous series?

- A** CH₄, C₂H₄, C₃H₈
- B** C₃H₆, C₃H₈, C₃H₇OH
- C** CH₃OH, C₂H₅OH, C₃H₇OH
- D** CH₃CO₂H, CH₃CH₂OH, HCO₂H

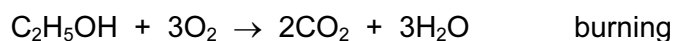
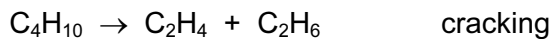
8 PVA is a polymer. The monomer has the structure shown.



To which homologous series does this compound belong?

	alcohols	alkenes
A	✓	✓
B	✓	x
C	x	✓
D	x	x

9 Ethanol is a fuel used in cars. It can be made from petroleum.

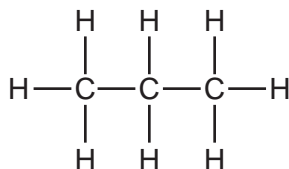
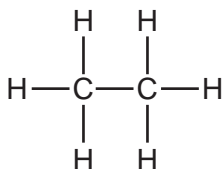


Compounds of how many homologous series appear in these equations?

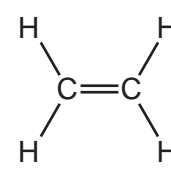
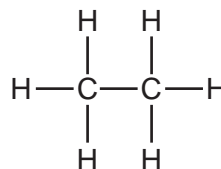
- A** 1 **B** 2 **C** 3 **D** 4

10 Which pair of compounds are members of the same homologous series?

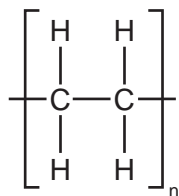
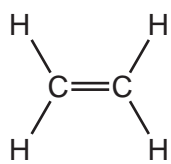
A



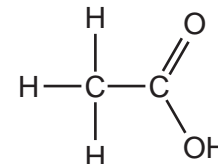
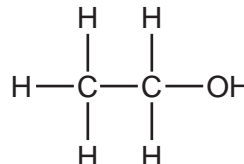
B



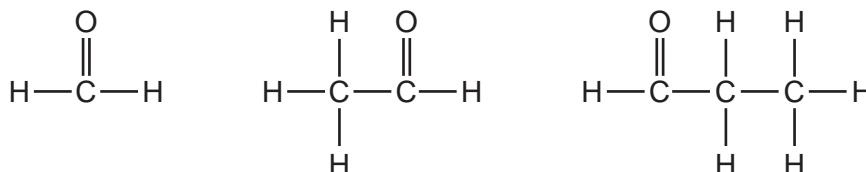
C



D



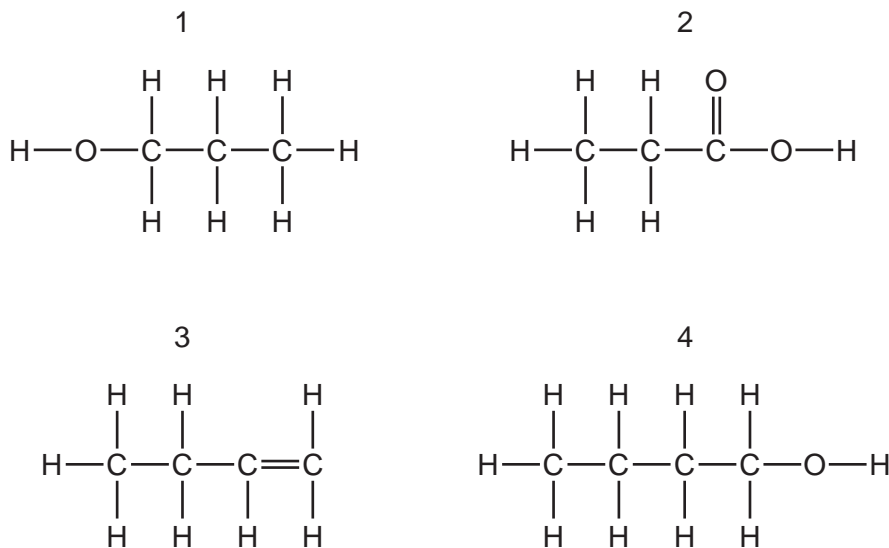
11 The diagram shows the structures of three compounds.



Why do these three compounds belong to the same homologous series?

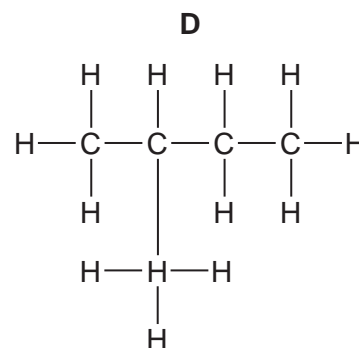
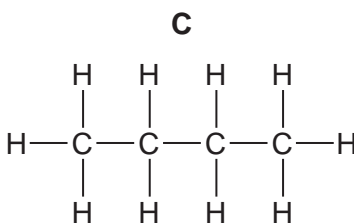
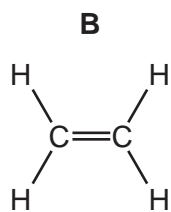
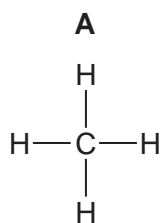
- A They all contain carbon, hydrogen and oxygen.
- B They all contain the same functional group.
- C They are all carbon based molecules.
- D They are all flammable liquids.

12 Which structures show compounds that are members of the same homologous series?



- A 1 and 2
- B 1 and 3
- C 2 and 4
- D 3 and 4

13 Which structure shows a compound that belongs to a **different** homologous series to propane?



14 Butene and hexene belong to the same homologous series.

What is the same for butene and hexene?

- A** boiling point
- B** functional group
- C** number of hydrogen atoms per molecule
- D** relative molecular mass

15 Which bond is **not** in a molecule of ethanoic acid?

- A** C–O
- B** C=O
- C** C=C
- D** O–H