

# Covalent Bonding

## Question Paper

Level	O Level
Subject	Chemistry
Exam Board	Cambridge International Examinations
Topic	The Particulate Nature of Matter
Sub-Topic	Covalent bonding
Booklet	Question Paper

**Time Allowed:** 23 minutes

**Score:** /19

**Percentage:** /100

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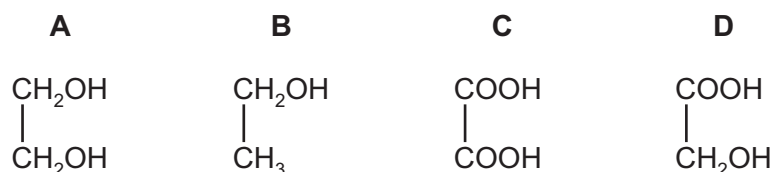
1 In order to form a compound with oxygen, an atom of a Group II element must

- A transfer two electrons to an atom of oxygen.
- B receive two electrons from an atom of oxygen.
- C share two electrons with an atom of oxygen.
- D bond with two atoms of oxygen.

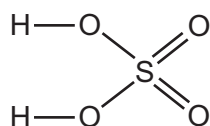
2 Which molecule contains **three** shared pairs of electrons between two of its atoms?

- A CO<sub>2</sub>                      B C<sub>2</sub>H<sub>4</sub>                      C H<sub>2</sub>O                      D N<sub>2</sub>

3 Which compound contains only eight covalent bonds?



4 A molecule of sulfuric acid has the structural formula shown.



How many electrons are involved in forming all the covalent bonds in one molecule?

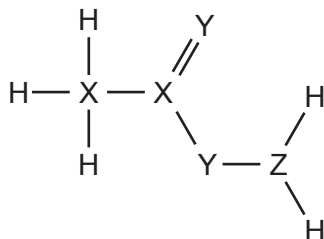
- A 6                      B 8                      C 12                      D 16

5 Which molecule has the **largest** number of electrons involved in covalent bonds?

- A C<sub>2</sub>H<sub>4</sub>                      B CO<sub>2</sub>                      C CH<sub>3</sub>OH                      D N<sub>2</sub>

- 6 Which molecule has only four electrons involved in covalent bonds?
- A**  $\text{H}_2\text{S}$                       **B**  $\text{CO}_2$                       **C**  $\text{Cl}_2$                       **D**  $\text{N}_2$
- 7 Which compound has molecules each of which contains only two covalent bonds?
- A**  $\text{CH}_4$                       **B**  $\text{H}_2\text{O}$                       **C**  $\text{MgCl}_2$                       **D**  $\text{Na}_2\text{O}$
- 8 Which molecule contains a total of three covalent bonds?
- A**  $\text{C}_2\text{H}_4$   
**B**  $\text{H}_2$   
**C**  $\text{H}_2\text{O}$   
**D**  $\text{N}_2$
- 9 A covalent bond is formed by
- A** electron sharing between metals and non-metals.  
**B** electron sharing between non-metals.  
**C** electron transfer between non-metals.  
**D** electron transfer from metals to non-metals.
- 10 How many of the molecules shown contain only one covalent bond?
- $\text{Cl}_2$                        $\text{H}_2$                        $\text{HCl}$                        $\text{N}_2$                        $\text{O}_2$
- A** 2                      **B** 3                      **C** 4                      **D** 5
- 11 Which pair of elements, when combined together, do **not** form a covalent compound?
- A** caesium and fluorine  
**B** nitrogen and chlorine  
**C** phosphorus and fluorine  
**D** sulfur and chlorine

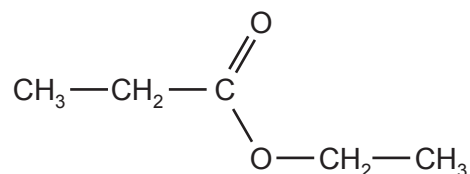
- 12 The diagram shows the structure of a covalent compound containing the element hydrogen, H, and the unknown elements X, Y and Z.



To which groups of the Periodic Table do these three elements, X, Y and Z, belong?

	X	Y	Z
A	1	5	6
B	4	5	1
C	4	6	5
D	5	1	4

- 13 The diagram shows the molecule ethyl propanoate.



How many bonding pairs of electrons are there in the molecule?

- A** 13                      **B** 16                      **C** 17                      **D** 20
- 14 Which statement is always true when two atoms join together by a covalent bond?
- A** One atom is a metal, the other atom is a non-metal.  
**B** One atom loses one electron, the other atom gains one electron.  
**C** The two atoms share one electron.  
**D** The two atoms share two electrons.

15 In which substance is each carbon atom covalently bonded to **only three** other atoms?

- A carbon dioxide
- B diamond
- C graphite
- D methane

16 Rubidium is in Group I and bromine is in Group VII of the Periodic Table.

How is a compound formed between rubidium and bromine?

- A Each atom of bromine shares an electron with an atom of rubidium.
- B Each atom of bromine shares a pair of electrons with an atom of rubidium.
- C Each atom of bromine gives an electron to an atom of rubidium.
- D Each atom of bromine receives an electron from an atom of rubidium.

17 The table shows the properties of some substances.

Which substance is a covalent compound?

	melting point /°C	electrical conductivity	
		of solid	of liquid
<b>A</b>	-38	conducts	conducts
<b>B</b>	-7	does not conduct	does not conduct
<b>C</b>	801	does not conduct	conducts
<b>D</b>	1540	conducts	conducts

18 Which **two** statements about a covalent bond are correct?

- 1 It can be formed between two metal atoms.
- 2 It can be formed between two non-metal atoms.
- 3 It is formed by the transfer of electrons between atoms.
- 4 It is formed by sharing electrons between atoms.

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

19 How many electrons are shared in the covalent bonding of a methane molecule?

**A** 2

**B** 4

**C** 6

**D** 8