

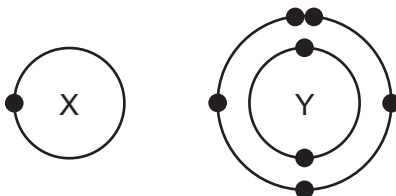
1 The table shows the electronic structure of four atoms.

| atom | electronic structure |
|------|----------------------|
| W | 2,8,1 |
| X | 2,8,4 |
| Y | 2,8,7 |
| Z | 2,8,8 |

Which two atoms combine to form a covalent compound?

- A** W and X **B** W and Y **C** X and Y **D** X and Z

2 The electronic structures of atoms X and Y are shown.



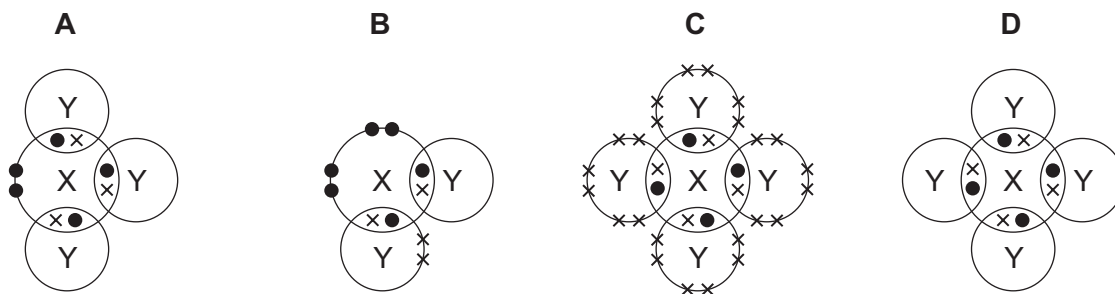
X and Y form a covalent compound.

What is its formula?

- A** XY_5 **B** XY_3 **C** XY **D** X_3Y

3 In the following diagrams, X and Y are atoms of different elements.

Which diagram correctly shows the arrangement of outer electrons in a molecule of methane?



4 In which compounds are pairs of electrons shared between atoms?

- 1 methane
- 2 lead bromide
- 3 sodium chloride

A 1 only **B** 2 only **C** 1 and 3 **D** 1, 2 and 3

5 Which statement about bonding is **not** correct?

- A** Carbon can form four single covalent bonds.
- B** Chlorine atoms react to gain a noble gas electronic structure.
- C** Covalent bonding involves losing and gaining electrons.
- D** Hydrogen molecules have the formula H_2 .

6 Covalent bonds are formed when electrons are1..... .

Most covalent compounds have2..... electrical conductivity.

Which words correctly complete gaps 1 and 2?

| | 1 | 2 |
|----------|-------------|------|
| A | shared | high |
| B | shared | low |
| C | transferred | high |
| D | transferred | low |

7 Sodium chloride is an ionic solid.

Which statement is **not** correct?

- A** Ions are formed when atoms lose or gain electrons.
- B** Ions in sodium chloride are strongly held together.
- C** Ions with the same charge attract each other.
- D** Sodium chloride solution can conduct electricity.

8 Caesium chloride and rubidium bromide are halide compounds of Group I elements.

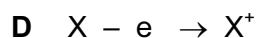
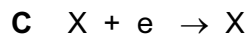
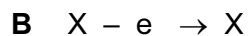
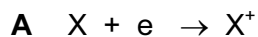
Caesium chloride has the formula1....., a relative formula mass2..... that of rubidium bromide and bonds that are3..... .

Which words correctly complete gaps 1, 2 and 3?

| | 1 | 2 | 3 |
|----------|------|----------------|----------|
| A | CaCl | different from | ionic |
| B | CaCl | the same as | covalent |
| C | CsCl | different from | ionic |
| D | CsCl | the same as | covalent |

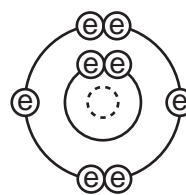
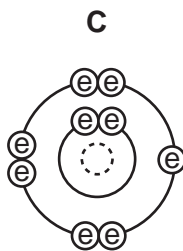
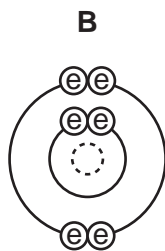
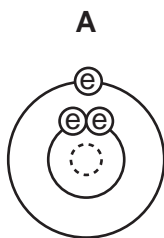
9 Element X is in Group I of the Periodic Table. X reacts with element Y to form an ionic compound.

Which equation shows the process that takes place when X forms ions?



10 The diagrams show the electron arrangements in the atoms of four elements.

Which element does **not** form a covalent bond?



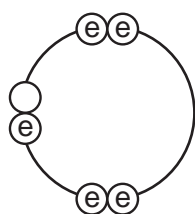
key

ⓔ electron

⊙ nucleus

- 11 Which statement about the bonding in a molecule of water is **not** correct?
- A Both hydrogen and oxygen have a noble gas configuration of electrons.
 - B Each hydrogen shares its one electron with oxygen.
 - C Oxygen shares one of its own electrons with each hydrogen.
 - D Oxygen shares two of its own electrons with each hydrogen.

- 12 Element X has six electrons in its outer shell.



key

ⓔ = electron

How could the element react?

- A by gaining two electrons to form a positive ion
 - B by losing six electrons to form a negative ion
 - C by sharing two electrons with two electrons from another element to form two covalent bonds
 - D by sharing two electrons with two electrons from another element to form four covalent bonds
- 13 Electrons from each element are shared by both of the elements in a compound.

Which compound matches this description?

- A lead bromide
- B sodium chloride
- C water
- D zinc oxide

14 In the molecules CH_4 , HCl and H_2O , which atoms use **all** of their outer shell electrons in bonding?

- A** C and Cl **B** C and H **C** Cl and H **D** H and O

15 Element X forms an acidic, covalent oxide.

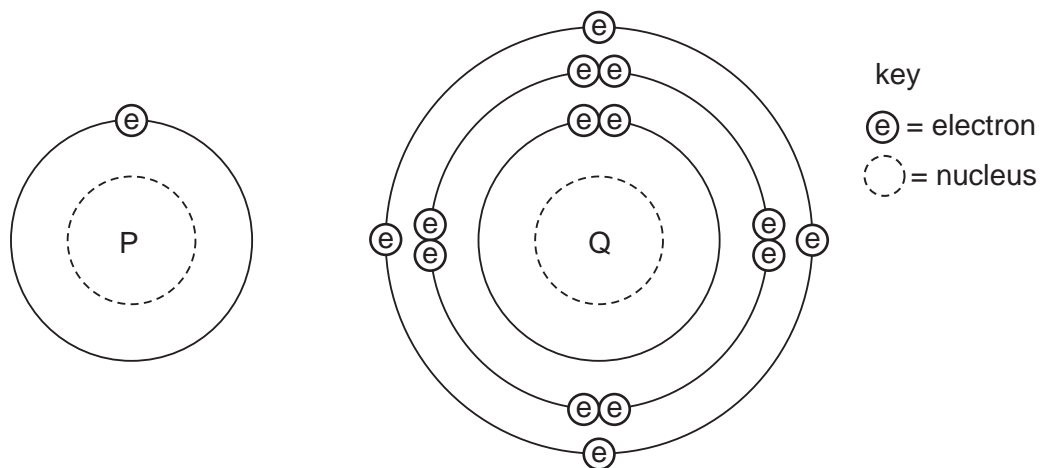
Which row shows how many electrons there could be in the outer shell of an atom of X?

| | 1 | 2 | 6 | 7 |
|----------|---|---|---|---|
| A | ✓ | ✓ | x | x |
| B | ✓ | x | ✓ | x |
| C | x | x | ✓ | ✓ |
| D | x | ✓ | x | ✓ |

16 Which is a simple covalent molecule?

| | conducts electricity | | volatile |
|----------|----------------------|-------------|----------|
| | when solid | when molten | |
| A | ✓ | ✓ | x |
| B | ✓ | x | ✓ |
| C | x | ✓ | x |
| D | x | x | ✓ |

17 The diagram shows the electronic structures of atoms P and Q.



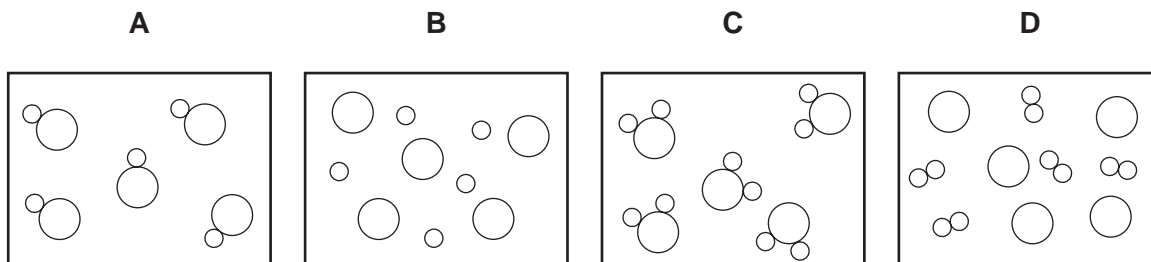
P and Q combine to form a molecule.

What is the formula of this molecule?

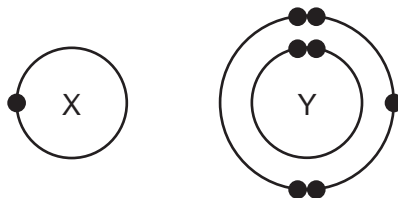
- A** PQ_4 **B** PQ **C** P_2Q **D** P_4Q

18 In the diagrams, circles of different sizes represent atoms of different elements.

Which diagram represents hydrogen chloride gas?



19 The electronic structures of atoms X and Y are shown.

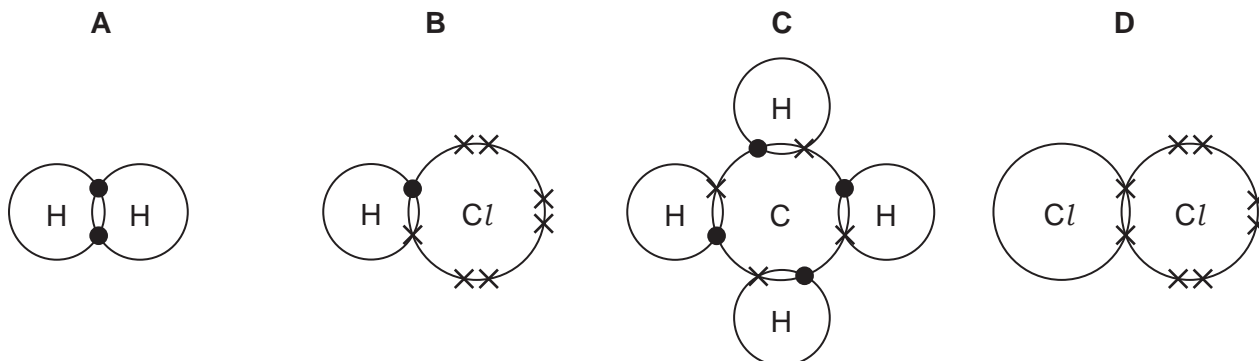


X and Y form a covalent compound.

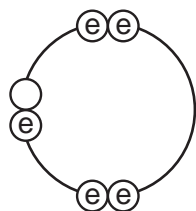
What is its formula?

- A** XY_5 **B** XY_3 **C** XY **D** X_3Y

20 Which diagram does **not** show the outer shell electrons in the molecule correctly?



21 Element X has six electrons in its outer shell.



key
 ⊕ = electron

How could the element react?

- A** by gaining two electrons to form a positive ion
B by losing six electrons to form a negative ion
C by sharing two electrons with two electrons from another element to form two covalent bonds
D by sharing two electrons with two electrons from another element to form four covalent bonds

22 In which compounds are pairs of electrons shared between atoms?

1 sodium chloride

2 methane

3 lead bromide

A 1 only

B 2 only

C 1 and 3

D 1, 2 and 3

23 Covalent bonds are formed when electrons are1..... . Covalent compounds have2..... electrical conductivity.

Which words correctly complete gaps 1 and 2?

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