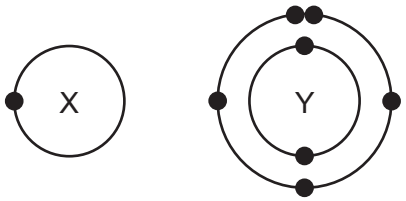
1 The table shows the electronic structure of four atoms.

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.

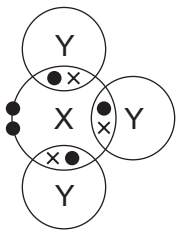
What is its formula?

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

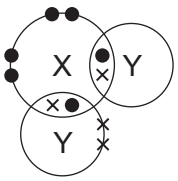
3 In the following diagrams, X and Y are atoms of different elements.

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

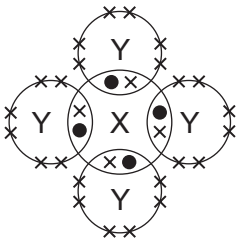
A



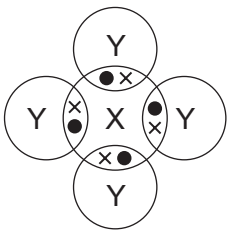
B



C



D



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 are ……1…… .

Most covalent compounds have ……2…… 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 formula ……1……, a relative formula mass ……2…… that of rubidium bromide and bonds that are ……3…… .

Which words correctly complete gaps 1, 2 and 3?

	1	2	3
A	Ca*Cl*	different from	ionic
B	Ca*Cl*	the same as	covalent
C	Cs*Cl*	different from	ionic
D	Cs*Cl*	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?

A $X + e \rightarrow X^+$

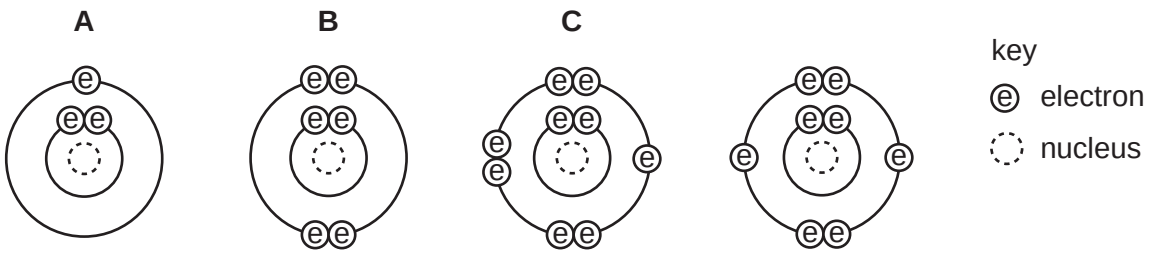
B $X - e \rightarrow X$

C $X + e \rightarrow X$

D $X - e \rightarrow X^+$

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

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



11 Which statement about the bonding in a molecule of water is **not** correct?

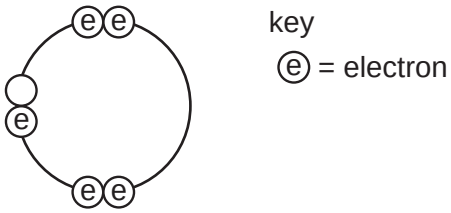
A Both hydrogen and oxygen have a noble gas configuration of electrons.

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.



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.

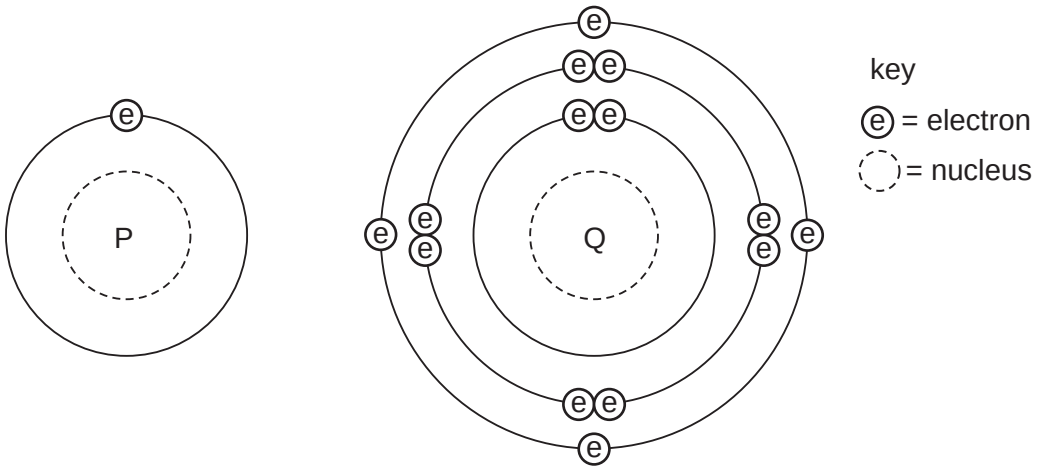
Which row shows how many electrons there could be in the outer shell of an atom of X?

	1	2	6	7
A	✓	✓	✗	✗
B	✓	✗	✓	✗
C	✗	✗	✓	✓
D	✗	✓	✗	✓

16 Which is a simple covalent molecule?

	conducts electricity		volatile
	when solid	when molten	
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✗
D	✗	✗	✓

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



P and Q combine to form a molecule.

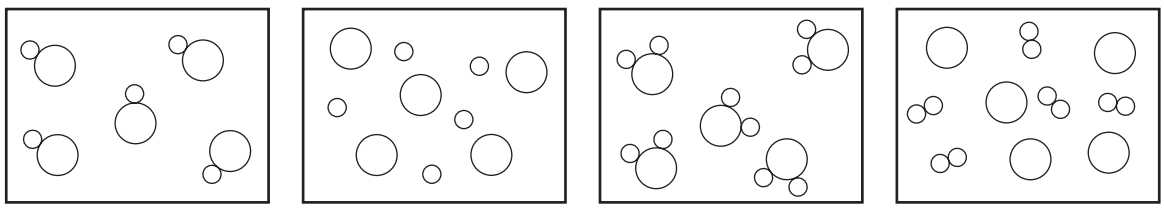
What is the formula of this molecule?

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?

A **B** **C** **D**



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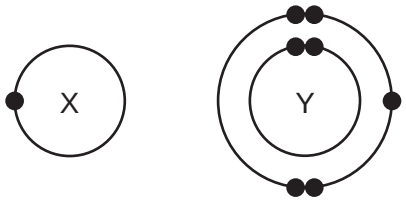


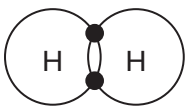
X and Y form a covalent compound.

What is its formula?

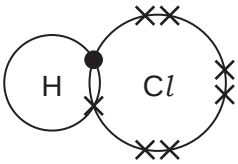
A XY_5 **B** XY_3 **C** XY **D** X_3Y

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

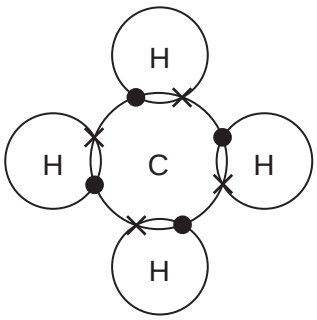
A



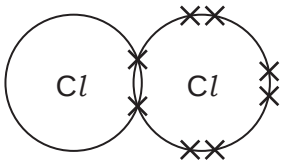
B



C



D



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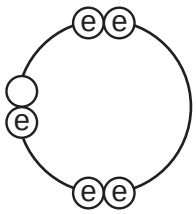

key
ⓔ = electron

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