

Chem!stry

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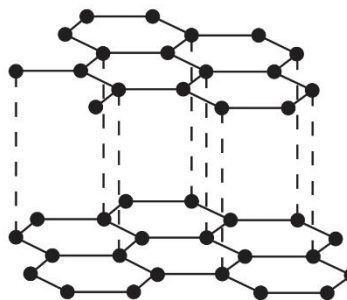
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Multiple-choice Questions on Atomic Structure and Chemical Bonding

- In which option do the three particles each have the same number of electrons?
A Cl^- Br^- I^-
B F^- Ne Na^+
C K^+ Ca^{2+} Br^-
D Li^+ Na^+ K^+
- 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.
- The diagram shows the structures of diamond and graphite.



diamond



graphite

Which property do these substances have in common?

- They are giant structures.
They can act as lubricants.
They can conduct electricity.
They contain only covalent bonds.
- An oxygen atom contains 8 electrons, 8 protons and 10 neutrons.
What is the nucleon number of this atom?
A 8 **B** 10 **C** 16 **D** 18

5. Calcium reacts with phosphorus to form the ionic compound calcium phosphide.

Which ions will this compound contain?

A Ca^{2+} and P^{3-}

B Ca^{2+} and P^{5-}

C Ca^{2-} and P^{3+}

D Ca^{2-} and P^{5+}

6. All of the following substances can conduct electricity.

Which substance's conductivity is **not** due to the movement of electrons?

A Aluminium

B Graphite

C Lithium chloride

D Mercury

7. Element **X** does not conduct electricity and has a low melting point.

Which could be element **X**?

A Carbon (graphite)

B Iodine

C Mercury

D Sodium

8. The table gives the arrangements of electrons in the atoms of four different elements.

Which element does **not** form an ionic compound with chlorine?

	arrangement of electrons
A	2, 1
B	2, 4
C	2, 8, 1
D	2, 8, 2

9. For which compound is the type of bonding correct?

	compound	bonding
A	ammonia	ionic
B	carbon dioxide	covalent
C	sodium chloride	covalent
D	water	ionic

10. Why do graphite and diamond have different physical properties?

A Diamond has a giant molecular structure, but graphite has not.

B Diamond occurs naturally but graphite is made artificially.

C Graphite is ionic whereas diamond is covalent.

D They contain carbon atoms covalently bonded to different numbers of other carbon atoms.

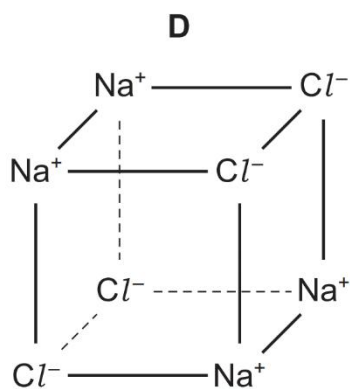
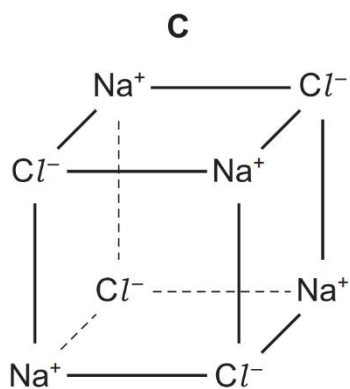
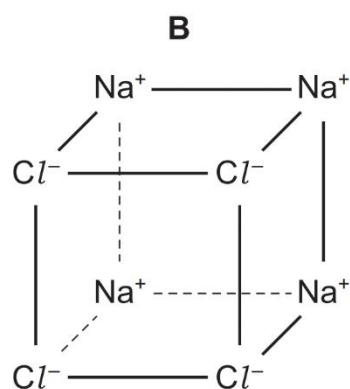
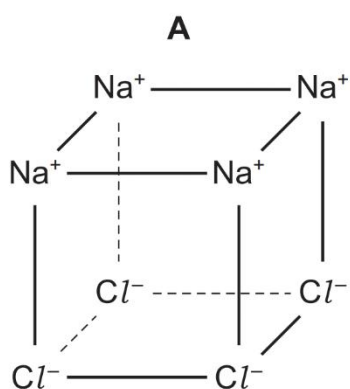
11. Which statement about the particles O^{2-} , F^- , Ne , Na^+ and Mg^{2+} is true? They all...

- A Contain more electrons than protons.
- B Contain more neutrons than protons.
- C Contain the same number of electrons.
- D Contain the same number of neutrons.

12. Which substance will **not** conduct electricity at room temperature and pressure?

- A dilute nitric acid
- B graphite
- C mercury
- D sodium chloride

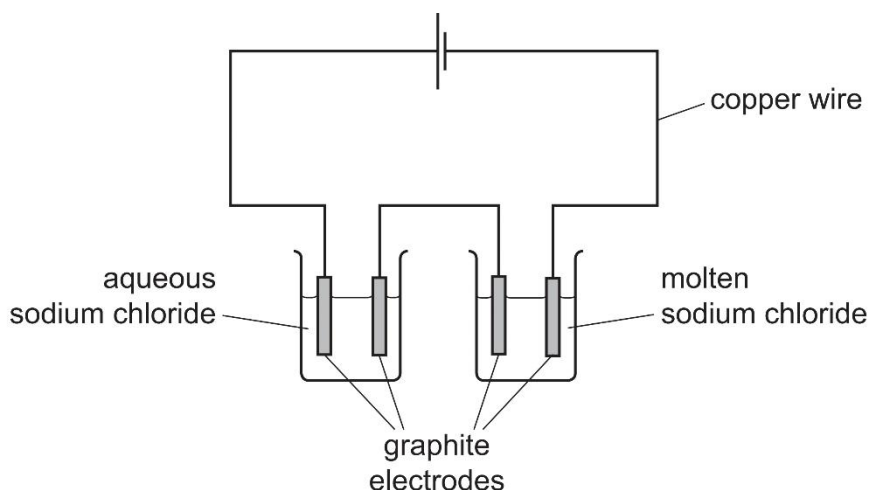
13. Which diagram correctly shows the arrangement of the ions in solid sodium chloride?



14. Which statement about chlorine atoms and chloride ions is correct?

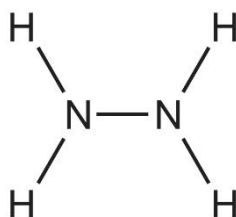
- A They are both isotopes of chlorine.
- B They undergo the same chemical reactions.
- C They have the same number of protons.
- D They have the same physical properties.

15. The diagram shows the electrolysis of aqueous sodium chloride and of molten sodium chloride.



Which substance in the diagram has both positive ions and mobile electrons?

- A Aqueous sodium chloride B Copper wire
 C Graphite electrodes D Molten sodium chloride
16. The diagram shows the structural formula of the covalent molecule hydrazine, N_2H_4 .



Consider **all** the electrons in a molecule of hydrazine.

Which description fits the arrangement of these electrons in the molecule?

	total number of electrons involved in bonding	total number of electrons not involved in bonding
A	5	4
B	5	8
C	10	4
D	10	8

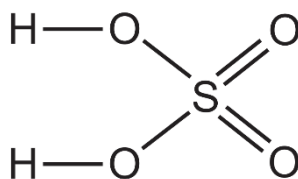
17. Which statement describes ionic bonding?

- A A lattice of ions in a 'sea' of electrons.
 B Electrostatic attraction between oppositely charged ions.
 C The sharing of electrons between atoms to gain a noble gas configuration.
 D The transfer of electrons from atoms of a non-metal to the atoms of a metal.

18. How is the compound magnesium sulfide, MgS, formed?

	magnesium	sulfur
A	gains 1 electron	loses 1 electron
B	shares 1 electron	shares 1 electron
C	loses 2 electrons	gains 2 electrons
D	shares 2 electrons	shares 2 electrons

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



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

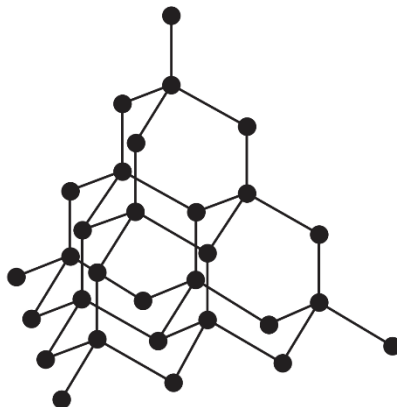
- A** 6 **B** 8 **C** 12 **D** 16

20. A metal consists of a lattice of positive ions in a 'sea of electrons'.

What happens to the electrons and positive ions in a metal wire when an electric current is passed through it?

	electrons	positive ions
A	replaced by new electrons	replaced by new ions
B	replaced by new electrons	unchanged
C	unchanged	replaced by new ions
D	unchanged	unchanged

21. The diagram shows the structure of which element in Period 3?



- A** Aluminium **B** Magnesium
C Silicon **D** Sodium

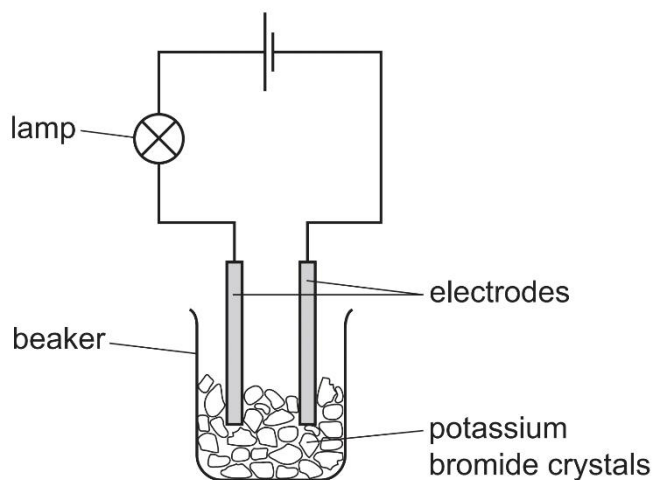
22. The table contains information on the structure of four particles.

particle	atomic number	number of protons	number of neutrons	number of electrons
Mg	12	12	W	12
Mg ²⁺	12	12	12	X
F	Y	9	10	9
F ⁻	9	9	10	Z

What are the values of **W**, **X**, **Y** and **Z** in the table above?

	W	X	Y	Z
A	10	12	9	10
B	12	10	9	10
C	12	10	10	9
D	12	12	10	9

23. The experiment shown is used to test potassium bromide crystals.



The lamp does not light. Distilled water is then added to the beaker and the lamp lights.

Which statement explains these results?

- A** Electrons are free to move in the solution when potassium bromide dissolves.
- B** Metal ions are free to move when potassium bromide melts.
- C** Metal ions are free to move when potassium reacts with water.
- D** Oppositely charged ions are free to move in the solution when potassium bromide dissolves.

24. Some students wrote three statements about the bonding in a molecule of ammonia, NH_3 .
- 1 A nitrogen atom has three outer electrons so all outer electrons are involved in bonding.
 - 2 A nitrogen atom has five outer electrons so two outer electrons are not involved in bonding.
 - 3 A nitrogen atom shares electrons with each of three hydrogen atoms.

Which statements about the bonding in ammonia are correct?

- A 1 and 3 only B 1 only
 C 2 and 3 only D 2 only
25. The table shows some properties of four solid elements.

Which element could be graphite?

	electrical conductivity	melting point / °C
A	good	97
B	good	3550
C	poor	113
D	poor	4750

26. A particle of an isotope of sulfur contains 18 neutrons and 18 electrons.

What is the symbol for this particle?

- A ${}_{16}^{34}\text{S}^{2+}$ B ${}_{16}^{34}\text{S}$ C ${}_{16}^{34}\text{S}^{2-}$ D ${}_{16}^{36}\text{S}$

27. When two elements react together, a compound is formed.

Which statement is correct?

- A Equal masses of the elements must be used.
 B The compound shows similar chemical properties to those of the elements.
 C The elements must both be non-metals.
 D When the elements react together, ionic or covalent compounds form.

28. Which statement is correct for all ionic compounds?

- A They dissolve in water.
 B They are formed when metals share electrons with non-metals.
 C They conduct electricity in the molten state.
 D They conduct electricity in the solid state.

29. When a piece of sodium is heated in air, it reacts with oxygen to form the ionic compound sodium oxide, Na_2O . In terms of electrons, which statement correctly explains what happens when sodium reacts with oxygen?

- A An oxygen atom shares two electrons with two sodium atoms.
- B A sodium atom loses two electrons which are transferred to an oxygen atom.
- C A sodium atom shares its outer shell electron with two oxygen atoms.
- D Two sodium atoms each lose one electron which are both transferred to one oxygen atom.

30. Which diagram best represents the structure of a solid metal?

A

B

C

D

key

⊖ a negative ion

⊕ a positive ion

– an electron

31. Magnesium oxide has a high melting point. It is used to line the inside of furnaces that operate at high temperatures.

Why does magnesium oxide have a high melting point?

- A It has metallic bonds.
- B It has strong forces between its molecules.
- C It is a simple molecular substance.
- D It is an ionic compound.

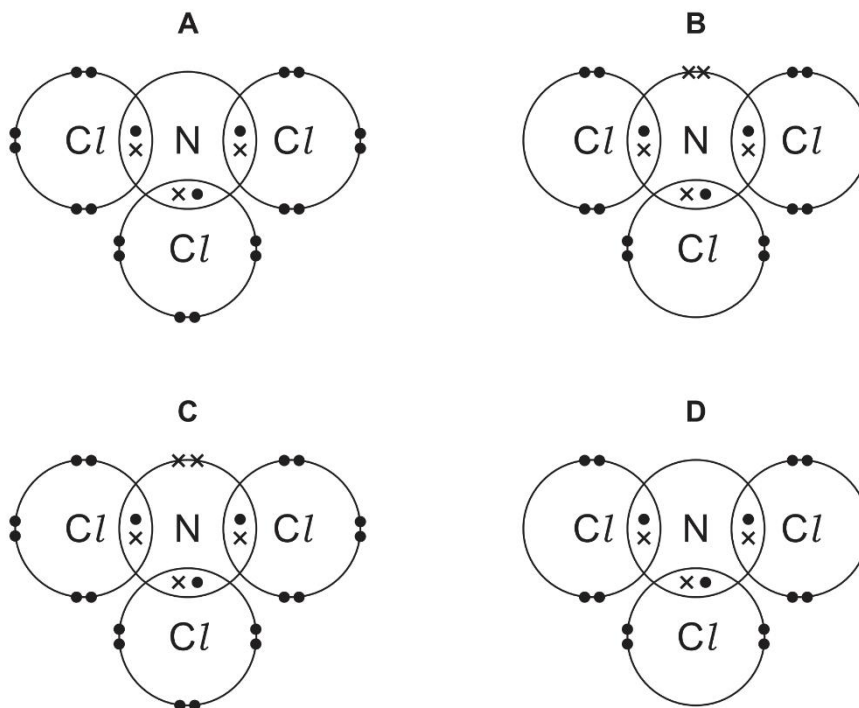
32. Two properties of a metal are given.

- 1 It is malleable.
- 2 It conducts electricity.

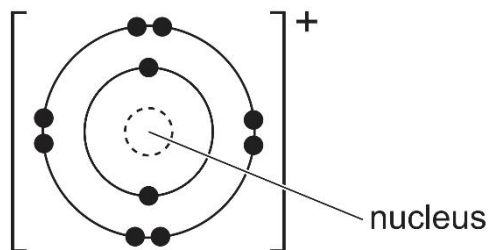
Which of these properties are due to the layers of positive ions being able to move?

- A 1 only
- B 2 only
- C both 1 and 2
- D neither 1 nor 2

33. What is the dot-and-cross diagram for NCl_3 ?



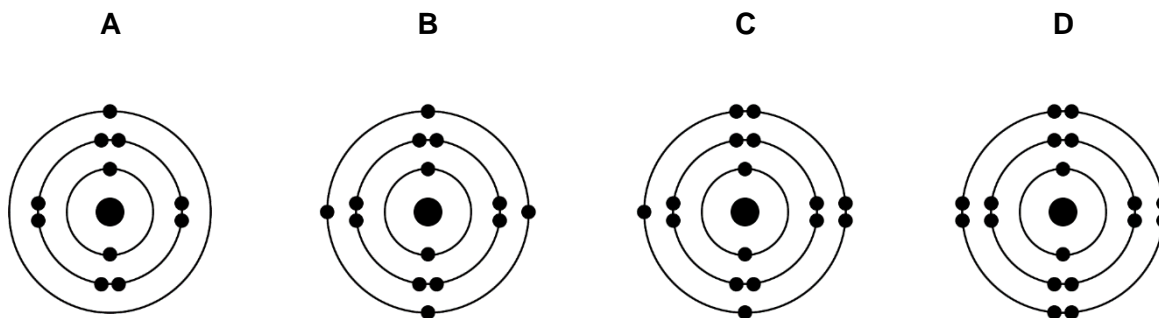
34. The diagram of an ion is shown.



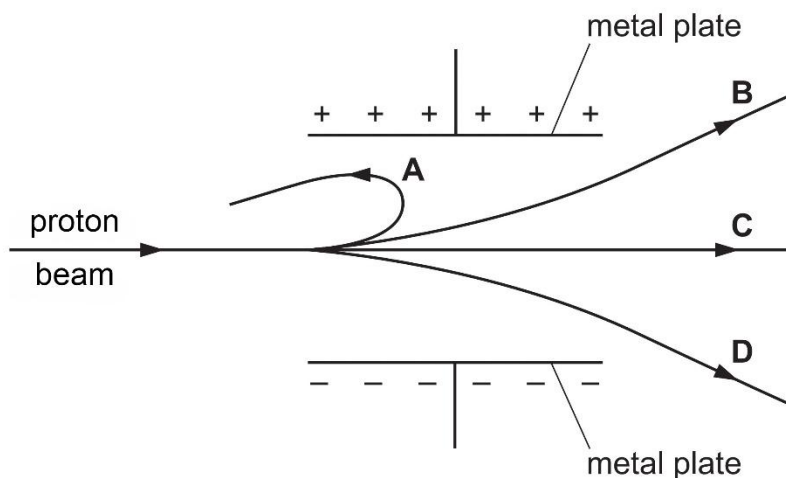
What can be deduced about the number of protons in this ion?

- A It has 9 protons.
- B It has 10 protons.
- C It has 11 protons.
- D It has 12 protons.

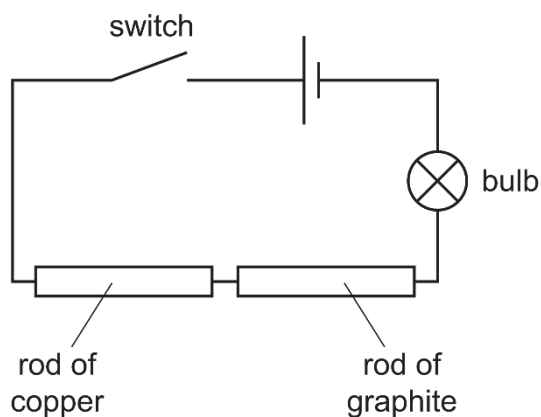
35. The diagram below shows the electronic configurations of four atoms. Which atom is chemically unreactive?



36. The diagram below shows a beam of protons being fired between two oppositely charged metal plates. Which path would the proton beam take as it passes between the metal plates?



37. The circuit diagram shows an experiment using a rod of copper and a rod of graphite.

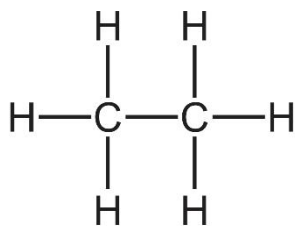


When the switch is closed, the bulb lights because an electric current flows through the copper and the graphite.

Which particles move through these two solids?

	copper ions	electrons	carbon ions
A	✓	✗	✓
B	✗	✓	✗
C	✓	✓	✗
D	✗	✓	✓

38. The diagram shows the covalent bonds in an organic compound.



The total number of electrons in one molecule of this compound isX..... .

The total number of electrons in the bonds in one molecule of this compound isY..... .

Which numbers correctly complete gaps X and Y?

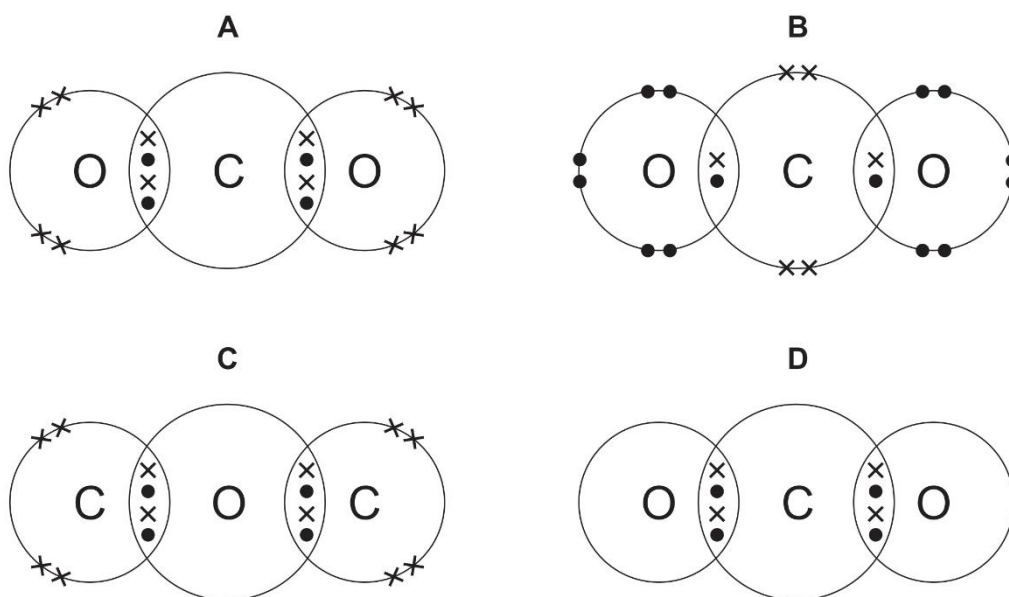
	X	Y
A	14	12
B	14	14
C	18	12
D	18	14

39. Which statement about atoms and ions is correct?

- A Atoms and ions of the same element must have different numbers of neutrons.
- B Isotopes of different elements must have different numbers of neutrons.
- C The charge on a positive ion = (nucleon number – number of neutrons – number of electrons).
- D The number of protons and number of neutrons in an atom must be the same.

40. The bonding in a molecule of carbon dioxide can be represented by a dot-and-cross diagram.

Which diagram is correct?



41. Which statement about the structure or bonding of metals is correct?
- A A metal lattice consists of negative ions in a 'sea of electrons'.
 - B Electrons in a metal move randomly through the lattice.
 - C Metals are malleable because the ions present are mobile.
 - D The ions in a metal move when positive and negative electrodes are attached.

42. An element **X** forms a positive ion with the electronic structure 2, 8, 8.

What is the proton (atomic) number of **X**?

- A 16
- B 17
- C 18
- D 19

43. Which two substances are elements with a giant molecular structure?

- A Diamond and graphite
- B Diamond and sand
- C Methane and iodine
- D Methane and sand

44. Which compound has both ionic and covalent bonds?

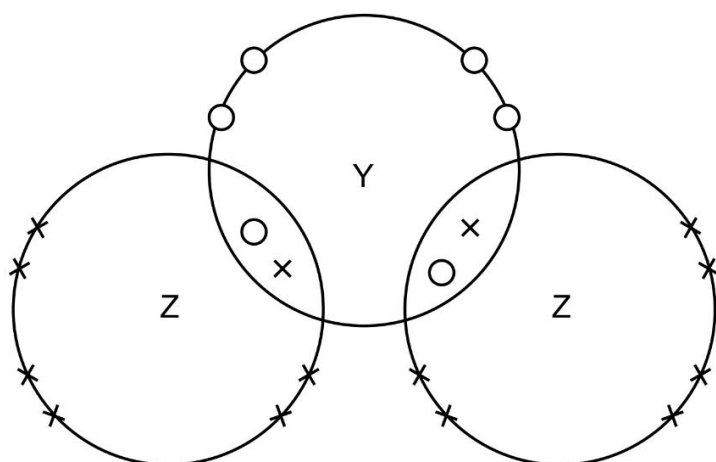
- A Ammonium chloride
- B Carbon dioxide
- C Ethyl ethanoate
- D Sodium chloride

45. Which statement about the numbers of particles in atoms is correct?

Apart from hydrogen, most atoms contain...

- A More neutrons than protons.
- B More protons than neutrons.
- C More electrons than protons.
- D More protons than electrons.

46. The outer shell electrons in a molecule, **YZ₂**, are shown.



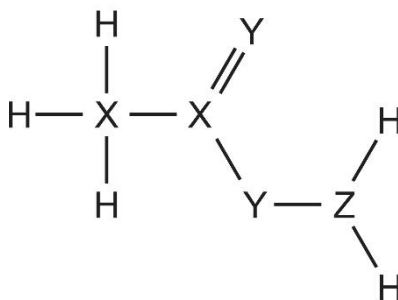
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- electrons of atom Y
- × electrons of atom Z

Using the Periodic Table, how many protons are in atom **Y**?

- A 6
- B 8
- C 12
- D 18

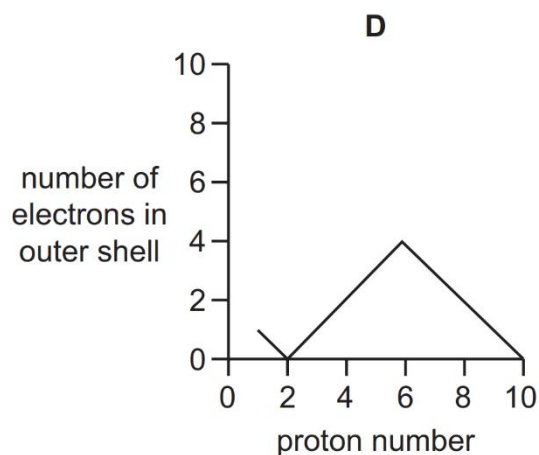
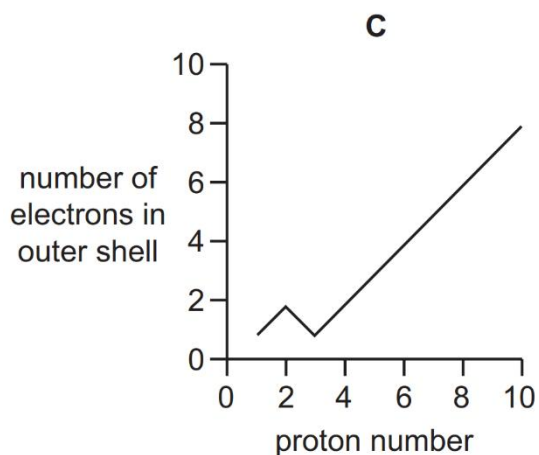
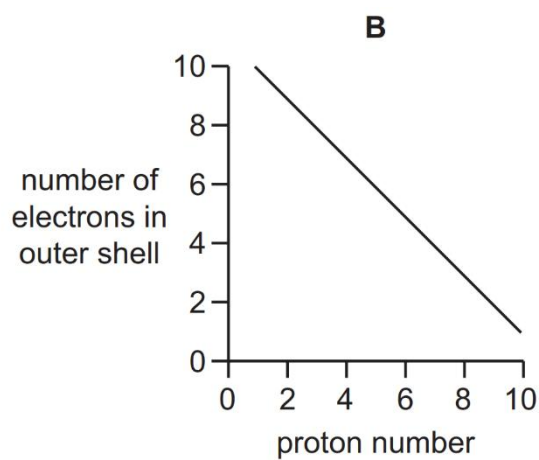
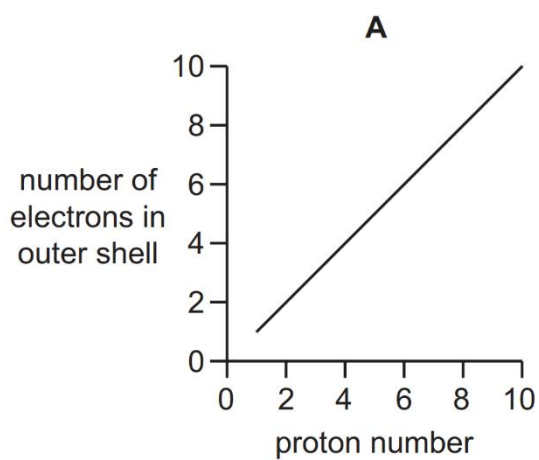
47. The diagram shows the structure of a covalent compound containing the element hydrogen, H, and the unknown elements X, Y and Z.



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

	X	Y	Z
A	1	15	16
B	14	15	1
C	14	16	15
D	15	1	14

48. Which graph shows the number of electrons in the outer shell of an atom, plotted against the proton (atomic) number for the first ten elements in the Periodic Table?



49. 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
50. Which molecule has the **largest** number of electrons involved in covalent bonds?
- A C₂H₄
 - B CO₂
 - C CH₃OH
 - D N₂
51. In which of the following is there a lattice of positive ions in a 'sea of electrons'?
- A Liquid potassium chloride
 - B Sand
 - C Solid graphite
 - D Solid magnesium
52. Which statement about both chlorine atoms and chloride ions is correct?
- A They are chemically identical.
 - B They are isotopes of chlorine.
 - C They have the same number of protons.
 - D They have the same physical properties.
53. 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.
54. Element **X** has the electronic structure 2,8,5. Element **Y** has the electronic structure 2,8,7.
What is the likely formula of a compound containing only **X** and **Y**?
- A XY₃
 - B X₂Y₃
 - C X₃Y
 - D X₃Y₂
55. The proton number of element **X** is 6. The proton number of element **Y** is 9.
What is the formula of a compound of these elements?
- A X₂Y₃
 - B X₃Y₂
 - C XY₃
 - D XY₄
56. In which ionic compound are the greatest number of electrons transferred from the metal to the non-metal during bonding?
- A AlCl₃
 - B BaS
 - C Ca₃N₂
 - D Na₃P

57. Four substances have the following electrical properties.

substance	property
W	does not conduct under any conditions
X	conducts only in aqueous solution
Y	conducts in both the molten and solid states
Z	conducts in both the molten and aqueous states

What are these four substances?

	W	X	Y	Z
A	HCl	S	NaCl	Pb
B	Pb	HCl	NaCl	S
C	S	HCl	Pb	NaCl
D	S	NaCl	HCl	Pb

58. An atom, **X**, contains 16 protons.

Which statement about **X** is correct?

- A** It cannot form an ion.
- B** It contains 6 electrons in the outer shell.
- C** It contains 6 neutrons.
- D** It has relative atomic mass of 16.

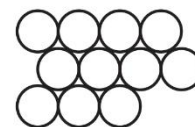
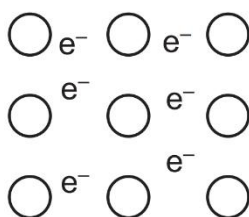
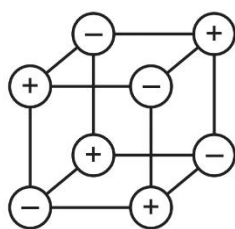
59. Which statement about conduction of electricity is correct?

- A** Electricity is conducted in aqueous solution by electrons.
- B** Electricity is conducted in a metal wire by ions.
- C** Electricity is conducted in a molten electrolyte by electrons.
- D** Electricity is conducted in an acid solution by ions.

60. In terms of electrons, what happens when potassium combines with iodine to form a compound?

- A** The atoms of both elements each lose one electron.
- B** The atoms of both elements each gain one electron.
- C** The potassium atoms each lose one electron and the iodine atoms each gain one electron.
- D** The potassium atoms each gain one electron and the iodine atoms each lose one electron.

61. The diagrams show the arrangement of particles in three solids: krypton, potassium and sodium chloride.



In which order are the solids shown?

- A** Krypton; potassium; sodium chloride.
B Krypton; sodium chloride; potassium.
C Sodium chloride; krypton; potassium.
D Sodium chloride; potassium; krypton.
62. Naturally-occurring bromine has a relative atomic mass of 80 and consists entirely of two isotopes of relative atomic masses 79 and 81.
 What can be deduced about naturally-occurring bromine from this information only?
- A** Bromine contains the two isotopes in equal proportions.
B Bromine has different valencies.
C Bromine isotopes have different numbers of protons.
D Bromine is radioactive.
63. Which compound has molecules each of which contains only two covalent bonds?
- A** CH_4 **B** H_2O **C** MgCl_2 **D** Na_2O
64. An ionic 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.
65. Which substance conducts an electric current but remains chemically unchanged?
- A** Aluminium
B Aqueous sodium chloride
C Molten lead(II) bromide
D Pure ethanoic acid

66. Both magnesium oxide, MgO, and aluminium oxide, Al₂O₃, are solids at room temperature, 25 °C.

MgO has a melting point of 2852 °C and a boiling point of 3600 °C.

Al₂O₃ has a melting point of 2072 °C and a boiling point of 2880 °C.

Over which temperature range will **both** pure compounds conduct electricity?

- A 25 to 2852 °C
- B 2072 to 2852 °C
- C 2852 to 2880 °C
- D 2880 to 3600 °C

67. Which statement most clearly indicates that diamond and graphite are forms of carbon?

- A Both are crystalline solids.
- B Complete combustion of equal masses of both solids produces equal masses of carbon dioxide as the only product.
- C Graphite conducts electricity whereas diamond is an insulator.
- D Under suitable conditions graphite can be partially converted into diamond.

68. A radioactive isotope of carbon has more nucleons than the non-radioactive isotope, ¹²₆ C.

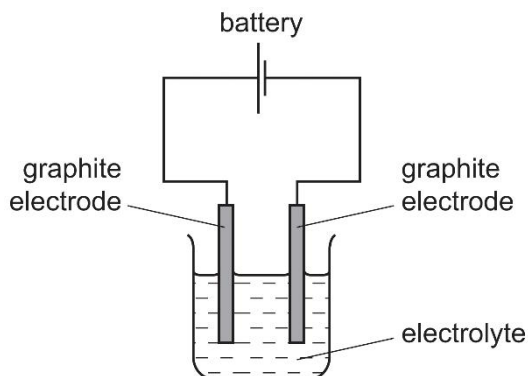
How many protons, neutrons and electrons could there be in this radioactive isotope of carbon?

	protons	neutrons	electrons
A	6	6	6
B	6	8	6
C	8	6	8
D	8	8	8

69. Which electronic configurations represent three metallic elements in the same period of the Periodic Table?

	element 1	element 2	element 3
A	2, 8, 7	2, 8, 8	2, 8, 1
B	2, 1	2, 8, 1	2, 8, 8, 1
C	2, 2	2, 3	2, 4
D	2, 8, 1	2, 8, 2	2, 8, 3

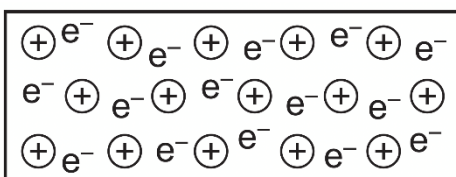
70. Graphite is often used as the electrodes in the electrolysis of solutions.



Which particles are involved in the conduction of electricity by graphite?

- A Electrons only
- B Negative ions only
- C Positive ions and electrons
- D Positive ions and negative ions

71. Element X has a lattice of positive ions and a 'sea of electrons'.



Which property will X have?

- A It conducts electricity by the movement of ions and electrons.
- B It has a high melting point.
- C It is decomposed by an electric current.
- D It is not malleable.

72. A particle contains 34 protons, 45 neutrons and 36 electrons.

Which symbol is correct for this particle?

- A ${}_{34}^{79}\text{Se}$
- B ${}_{34}^{79}\text{Se}^-$
- C ${}_{34}^{79}\text{Se}^{2-}$
- D ${}_{34}^{79}\text{Se}^{2+}$

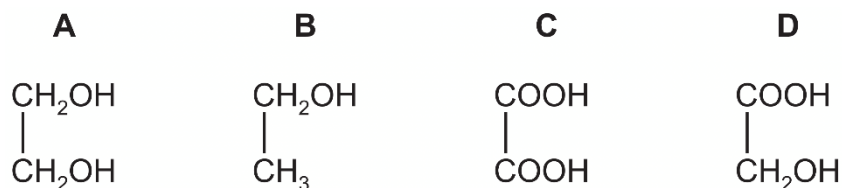
73. Which molecule contains three shared pairs of electrons between two of its atoms?

- A CO_2
- B C_2H_4
- C H_2O
- D N_2

74. What happens when sodium chloride melts?

- A Covalent bonds in a giant lattice are broken.
- B Electrons are released from atoms.
- C Electrostatic forces of attraction between ions are overcome.
- D Molecules are separated into ions.

75. Which compound contains only eight covalent bonds? Answer = B



76. Which substance has metallic bonding?

	conducts electricity		State of product formed on reaction with oxygen
	when solid	when liquid	
A	✓	✓	solid
B	✓	✓	gas
C	✗	✓	no reaction
D	✗	✗	solid

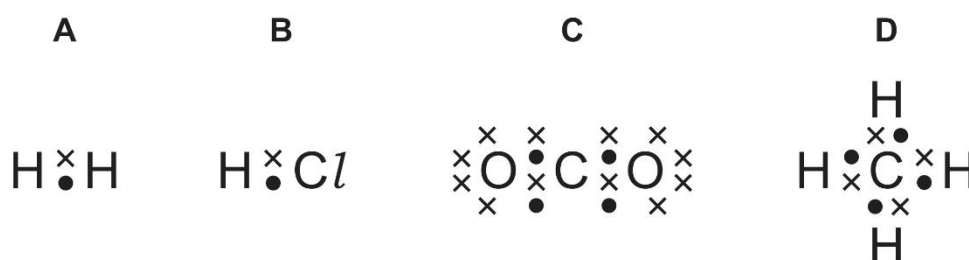
77. The symbols for two ions are shown.



Which statement is correct?

- A The fluoride ion contains more electrons than the sodium ion.
- B The sodium ion contains more neutrons than the fluoride ion.
- C The two ions contain the same number of electrons as each other.
- D The two ions contain the same number of protons as each other.

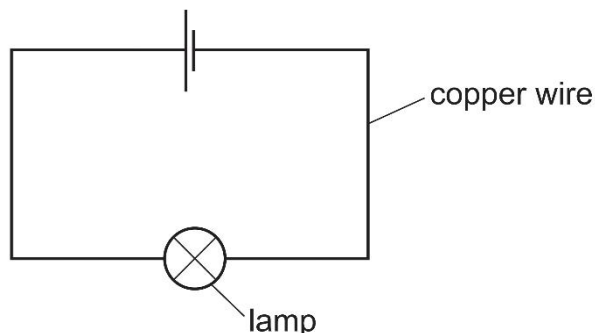
78. Which dot-and-cross diagram, showing all the outer shell electrons of each atom, is **not** correct?



79. In order to form a compound with oxygen, an atom of a Group 2 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.

80. Copper wire is used to complete an electrical circuit.



What happens in the copper wire?

- A Electrons move along the wire to the negative terminal. Positive ions stay in position.
- B Electrons move along the wire to the positive terminal. Positive ions move to the negative terminal.
- C Electrons move along the wire to the positive terminal. Positive ions stay in position.
- D Negative ions move along the wire to the positive terminal. Positive ions move to the negative terminal.

81. Which particle contains the same number of both neutrons and electrons?

- A ${}^{40}_{20}\text{Ca}^{2+}$
- B ${}^{24}_{12}\text{Mg}^{2+}$
- C ${}^{19}_9\text{F}^{-}$
- D ${}^{32}_{16}\text{S}^{2-}$

82. Which statement is correct for all metals?

- A They are hard and brittle.
- B They are made up of a lattice of positive and negative ions.
- C They conduct electricity by movement of electrons.
- D They conduct electricity by movement of ions.

83. X represents the element of atomic number 8 and Y represents the element of atomic number 19. The two elements react together to form a compound. Which row is correct for the compound formed?

	formula	type of bonding
A	Y_2X	covalent
B	Y_2X	ionic
C	X_2Y	covalent
D	X_2Y	ionic

84. Which row shows the number of particles in ${}_{16}^{34}\text{S}^{2-}$?

	protons	neutrons	electrons
A	16	16	16
B	16	18	18
C	18	16	20
D	20	14	22

85. Which particle contains the greatest number of electrons?



86. One atom of element **X** and two atoms of element **Y** react to form an ionic compound. Element **X** forms a positive ion. Which elements could **X** and **Y** be?

	X	Y
A	calcium	chlorine
B	calcium	oxygen
C	sodium	chlorine
D	sodium	oxygen

87. An element with a high melting point forms an oxide that is gaseous at room temperature. Which type of structure or bonding is present in the element?

A Giant covalent

B Ionic

C Metallic

D Simple molecular

88. Which statement explains why aluminium is malleable?

A Aluminium has layers of cations that can slide over one another.

B Aluminium has layers of electrons that can slide over one another.

C Aluminium has weak bonds between protons and a 'sea of electrons'.

D Aluminium is covered with a layer of unreactive aluminium oxide.

89. Which three elements exist as diatomic molecules at room temperature?

A Hydrogen, oxygen, helium

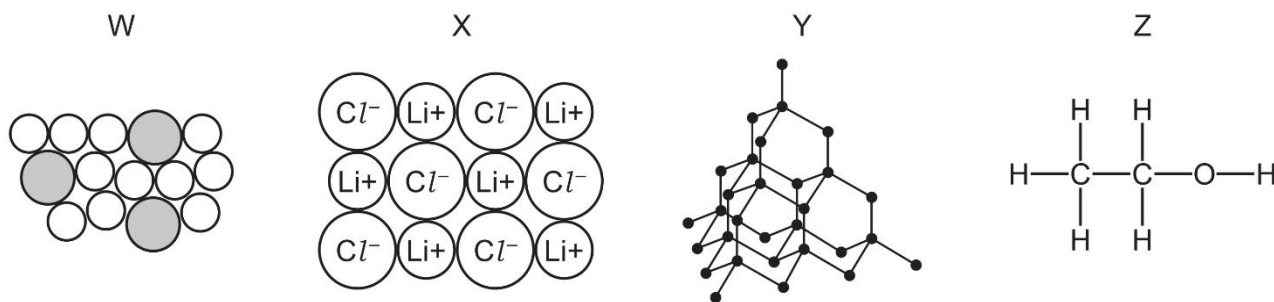
B Nitrogen, chlorine, neon

C Nitrogen, oxygen, fluorine

D Oxygen, chlorine, helium

90. An ion contains 20 electrons and has a charge of +3.
From which element was the ion formed?
A Aluminium **B** Calcium **C** Iron **D** Vanadium
91. Which statement is correct?
A Diamond conducts electricity while graphite does not.
B Graphite has delocalised ions between its layers.
C In diamond, each carbon atom is joined to three other carbon atoms only.
D The layered structure of graphite makes it slippery.
92. Which substances contain at least one double bond?
1 C₂H₄
2 O₂
3 C₂H₆
4 CO₂
A 1, 2 and 3 only **B** 2, 3 and 4 only
C 1, 2 and 4 only **D** 1, 3 and 4 only
93. What is a covalent bond?
A A pair of electrons shared by two non-metallic atoms.
B Electrons being shared by a lattice of positively charged ions.
C Elements losing electrons to achieve a noble gas structure.
D Oppositely charged particles strongly attracting each other.
94. Two particles have the symbols $^{54}_{26}\text{Fe}^{2+}$ and $^{59}_{27}\text{Co}^{3+}$.
Which statement about these particles is correct?
A They contain the same number of electrons.
B They contain the same number of neutrons.
C They contain the same number of protons.
D They do not contain the same number of protons, neutrons or electrons.
95. Two isotopes of chlorine are ^{35}Cl and ^{37}Cl .
Using these isotopes and ^{12}C and ^1H , how many different relative molecular masses are possible for the compound with molecular formula C₂H₃Cl₃?
A 2 **B** 3 **C** 4 **D** 5

96. Which statement about the substances, at room temperature and pressure, is correct?



- A W and X conduct electricity.
- B W and Y are elements.
- C X and Z dissolve in water.
- D Y and Z have low melting points.

97. A piece of magnesium reacts with dilute hydrochloric acid.

The resulting solution is then evaporated leaving a solid residue of magnesium chloride.

Which statement is correct?

- A A covalent solid is formed in this process.
- B Each chlorine atom gains one electron in this process.
- C Each magnesium atom loses only one electron in this process.
- D Molecules of an element are formed during the reaction.

98. Two statements about the structure and properties of metals are given.

statement 1 Metals are malleable and have high melting points.

statement 2 Metals have mobile electrons in their structure.

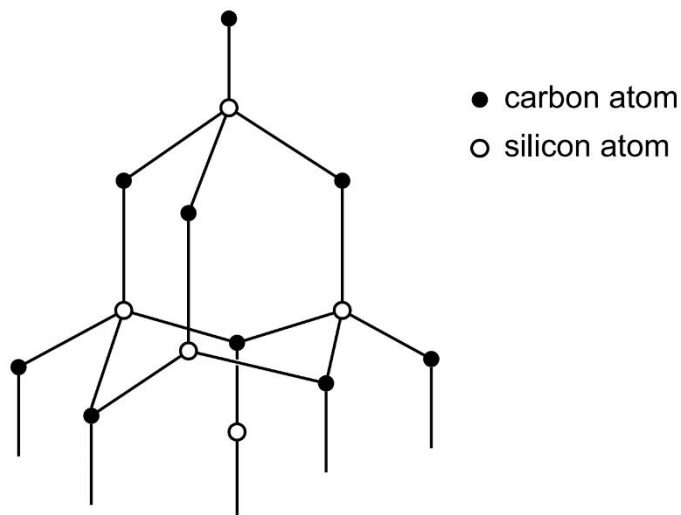
What is correct?

- A Both statements are correct and statement 2 explains statement 1.
- B Both statements are correct but statement 2 does not explain statement 1.
- C Statement 1 is correct but statement 2 is incorrect.
- D Statement 2 is correct but statement 1 is incorrect.

99. Which statement explains why sodium chloride, NaCl, has a lower melting point than magnesium oxide, MgO?

- A Sodium chloride is covalent, but magnesium oxide is ionic.
- B Sodium is more reactive than magnesium.
- C The attraction between Na^+ and Cl^- is weaker than that between Mg^{2+} and O^{2-} .
- D The melting point of sodium is lower than that of magnesium.

100. The diagram shows the structure of silicon carbide, SiC.

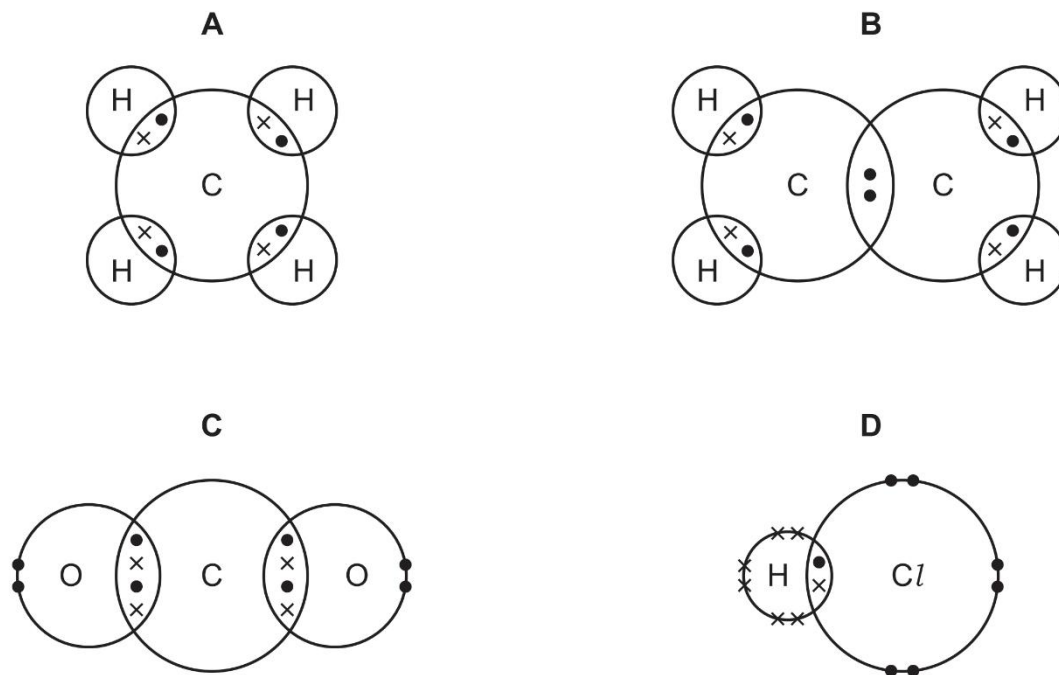


Which set of properties does silicon carbide have?

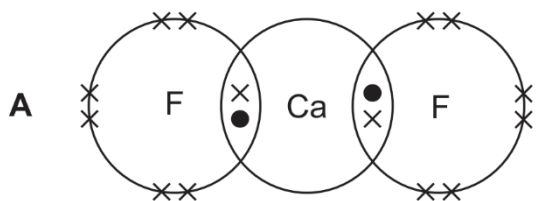
	physical state	when strongly heated in oxygen
A	soft solid	combusts, giving a solid residue only
B	soft solid	combusts, leaving no solid residue
C	hard solid	combusts, giving a solid residue and a colourless gas
D	hard solid	combusts, giving a solid residue only

101. The dot-and-cross diagrams for four compounds are shown.

Which diagram is correct? (Note that only the outer shell electrons are shown.)

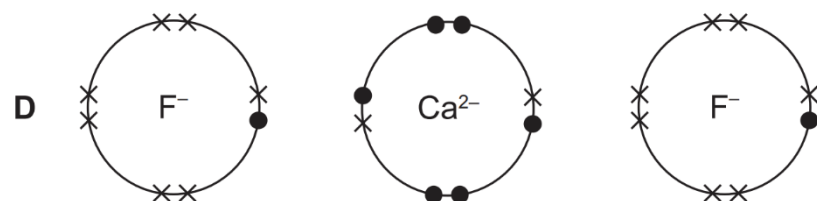
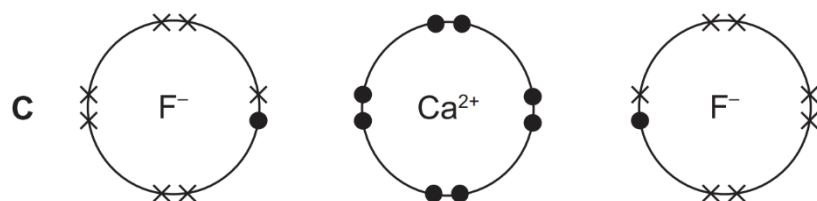
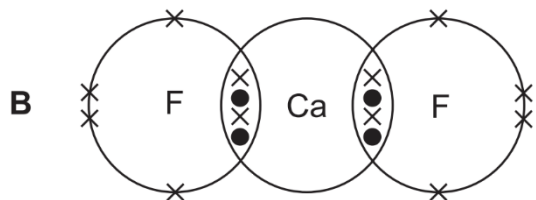


102. Which diagram shows the outer electron arrangement in calcium fluoride?



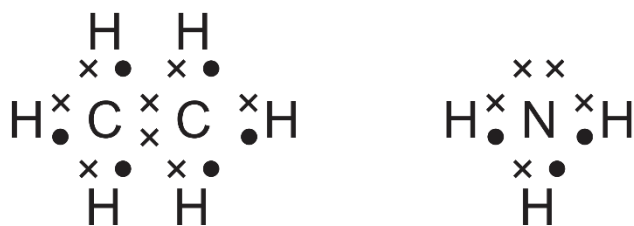
key

- an electron from calcium
- × an electron from fluorine



103. Ethane, C_2H_6 , and ammonia, NH_3 , are covalent compounds.

The dot-and-cross diagrams of these compounds are shown.



Which statements are correct?

- 1 A molecule of ethane contains twice as many hydrogen atoms as a molecule of ammonia.
- 2 An unreacted nitrogen atom has five outer electrons.
- 3 In a molecule of ethane, the bond between the carbon atoms is formed by sharing two electrons, one from each carbon atom.

A 1, 2 and 3

B 1 and 2 only

C 1 and 3 only

D 2 and 3 only

- Scan the QR Code below to view the answers to this assignment.



https://www.chemist.sg/chemical_bonding/assignment/bonding_assignment_mcq_ans.pdf