

General

[SPM07-07] Diagram 4 shows a snail. The snail shell contains a natural ionic compound.



Diagram 4

Other than oxygen, what elements are contained in the ionic compound?

- A calcium and carbon
- B calcium and hydrogen
- C sodium and carbon
- D sodium and hydrogen

Ionic Compound

[SBPTrial11-04] Which substance is an ionic compound?

- A Ammonia, NH_3
- B Ethanol, $\text{C}_2\text{H}_5\text{OH}$
- C Nitrogen dioxide, NO_2
- D Magnesium oxide, MgO

[SBPTrial07-17] Which of the following substances is made up of ions?

- A Sulphur
- B Naphthalene
- C Sulphur trioxide
- D Potassium chloride

[MRSM10-06] During the formation of ionic bonds, the atoms of elements

- A share electrons
- B accept electrons
- C donate electrons
- D transfer electrons

[SBPmidYear07F4-15] An atom that receives an electron forms

- A a cation
- B an anion
- C an ionic bond
- D a covalent bond

[SBPdiag08-33] An element represented by the symbol ${}^7_3\text{X}$

- A has three valence electrons
- B forms a positively charged ion.
- C is located in Group 17 of the Periodic Table.
- D has 3 protons and 7 neutrons.

[SBPtrial2010-04] Which of the following compounds is an ionic compound?

- A SO₂
- B SO₃
- C H₂O
- D MgBr₂

[SPM10-05] Element M and element L are located in Group 1 and Group 16 in the Periodic Table respectively. Element M reacts with element L to form a compound. What is the chemical formula of the compound?

- A ML
- B ML₂
- C M₂L
- D M₂L₃

[SPM07-26] The electron arrangement of an atom of M is 2.8.1 and the electron arrangement of an atom of X is 2.6. Elements M and X react to form a compound. Which of the following is true about the reaction?

- A Atom X donates 2 electrons
- B Atom M receives 1 electron
- C An ionic compound is formed
- D The compound formed has chemical formula MX₂

[SBPdiag07-02] Which of the following elements would form an ionic compound with chlorine?

- A Potassium
- B Hydrogen
- C Oxygen
- D Helium

[SPM05-38] An atom of element X has 4 shells containing electrons. When element X reacts with chlorine, a compound with formula XCl is formed. Which of the following is element X? [Proton Number: Na=11, Si=14, K=19, Ca=20]

- A Calcium
- B Potassium
- C Sodium
- D Silicone

[SPM09-16] Which statement is true about the reaction of a magnesium atom with fluorine to form magnesium fluoride? [Proton number: F=9, Mg=12]

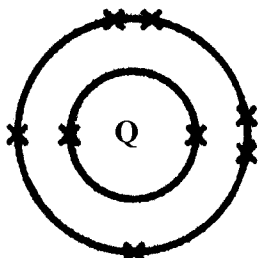
- A one magnesium atom donates one electron to one fluorine atom
- B one magnesium atom donates two electrons to two fluorine atoms
- C one magnesium atom shares one electron with one fluorine atom
- D one magnesium atom shares two electrons with two fluorine atoms

[SPM09-36] Element G reacts with element L to form a covalent compound with the formation GL_2 . The electron arrangement of an atom of L is 2.8.7.

Which of the following is a possible electron arrangement of an atom of G?

- A 2.8.1
- B 2.8.2
- C 2.8.4
- D 2.8.6

[SBPdiag06-43] The diagram shows the electrons arrangement of atom of element Q.



Element P can reacts with element Q to form an ionic compound with the formula PQ. What is the electron arrangement of atom P?

- A 2
- B 2.1
- C 2.8.1
- D 2.8.2

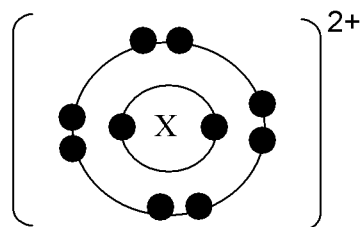
[SBPmidYear06-16] The table shows the information of element L.

- L is a metal
- L reacts with oxygen to form compound L_2O_3 .

What is the charge of ion L?

- A +2
- B -2
- C +3
- D -3

[SBPdiag07-33] The diagram shows the electron arrangement of an ion X^{2+}



Which of the following is true about an ion X^{2+} ?

- A Atom X receives electrons
- B The number of electrons for atom X is 8
- C Electron arrangement of atom X is 2.8
- D X is placed in the Period 3 in the Periodic Table

[SPM11-25] Diagram 6 shows the electrons arrangement of the Q⁻ ion.

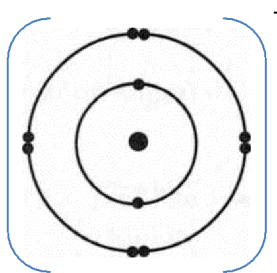
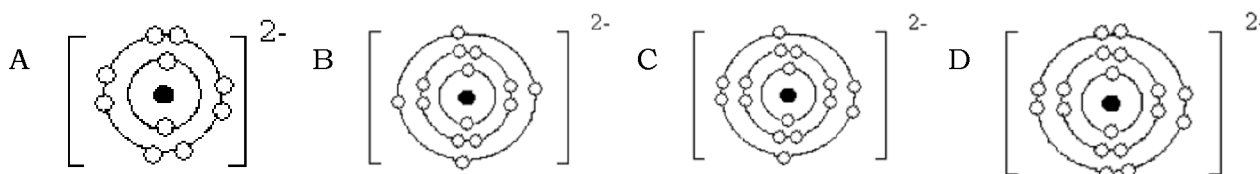


Diagram 6

What is the number of valence electrons of a Q atom?

- A 7
- B 8
- C 9
- D 10

[MRSM04-24] Which of the following diagram represents the correct electron configuration for sulphide ion? [Proton Number: S=16]



[SBPTrial09-14] Diagram 5 shows the symbol for atom Y.

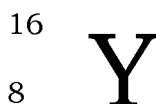
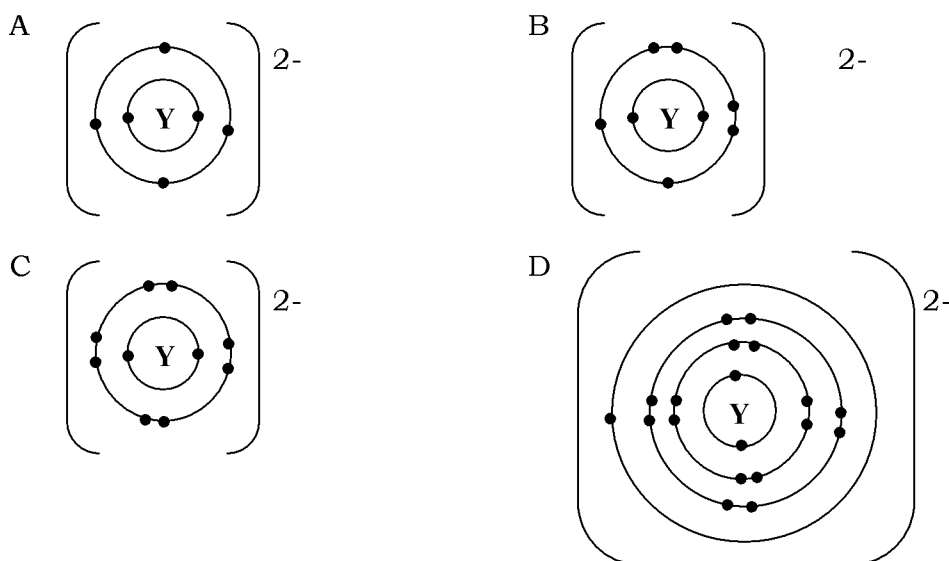


Diagram 5

Which of the following represents the electron arrangement for ion Y²⁻?



[MRSM09-22] Table 1 shows the number of neutrons, number of protons and number of electrons of four different particles.

Particle	Number of Neutrons	Number of Protons	Number of electrons
E	18	17	18
F	18	17	17
G	18	18	18
H	20	19	18

Table 1

Which of the following particles is an anion?

- A E
- B F
- C G
- D H

[SBPdiag08-27] An element X requires two electrons to form a stable negative ion. Which group is X located in the Periodic Table of Elements?

- A 2
- B 16
- C 17
- D 18

[SBPmidYear07F4-28] Element T reacts with oxygen to produce a solid with a formula TO . What is the electron arrangement of T?

- A 2
- B 2.1
- C 2.8.1
- D 2.8.2

[SPM11-26] Diagram 7 shows the electrons arrangements of atoms X and Y. X and Y are not the actual symbols of the elements.

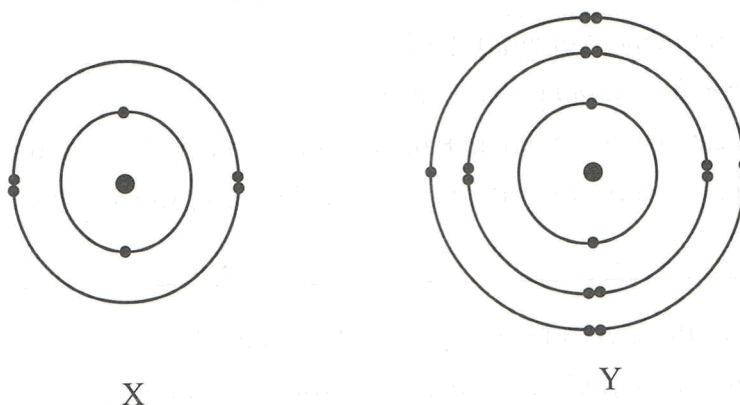


Diagram 7

Which pair of formula and the type of compound is correct?

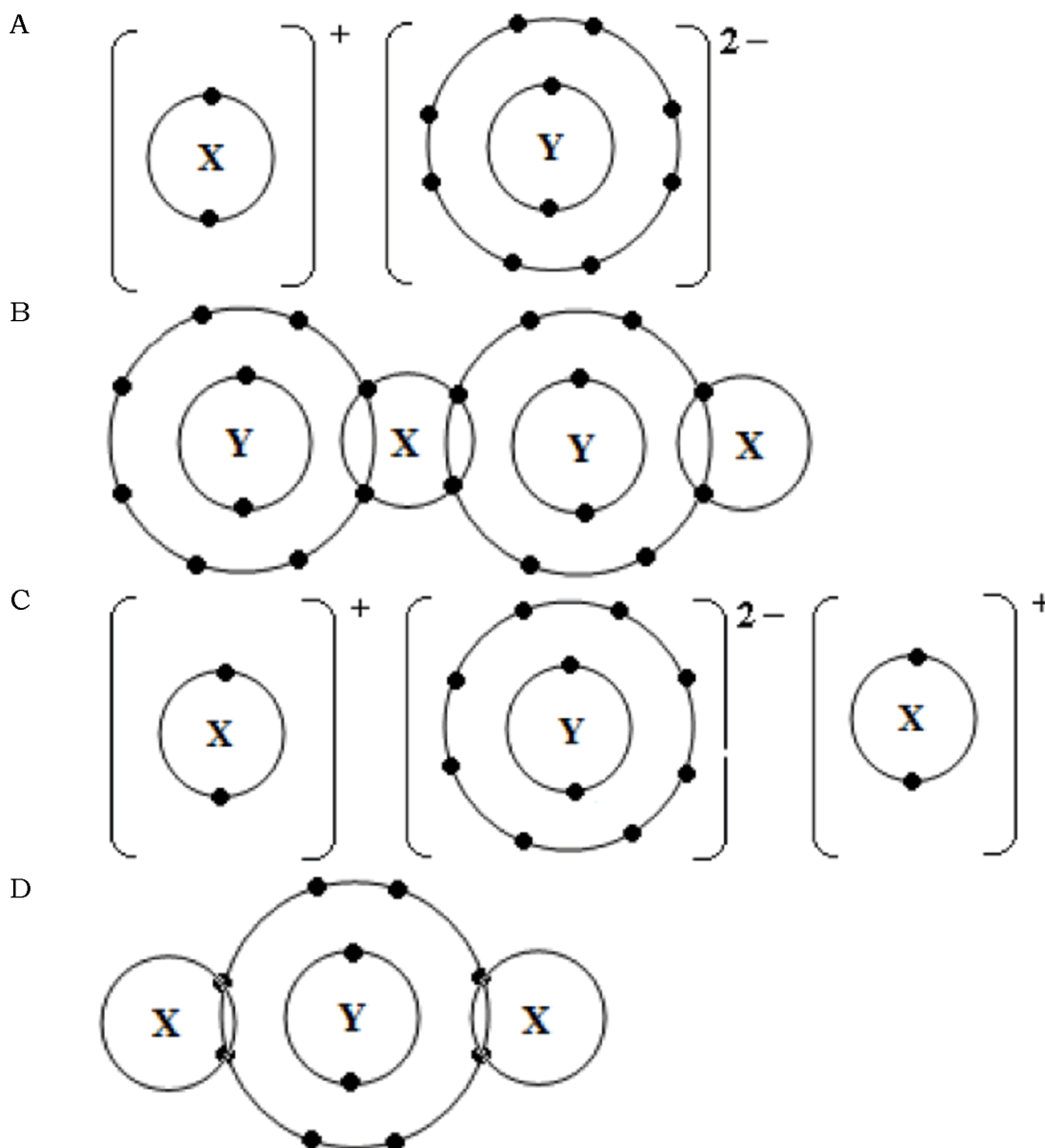
	Formula	Type of compound
A	XY_4	ionic
B	XY_4	covalent
C	X_4Y	ionic
D	X_4Y	covalent

[SBPtrial11-44] Diagram 13 shows the standard representation for the atoms of two elements, X and Y.



Diagram 13

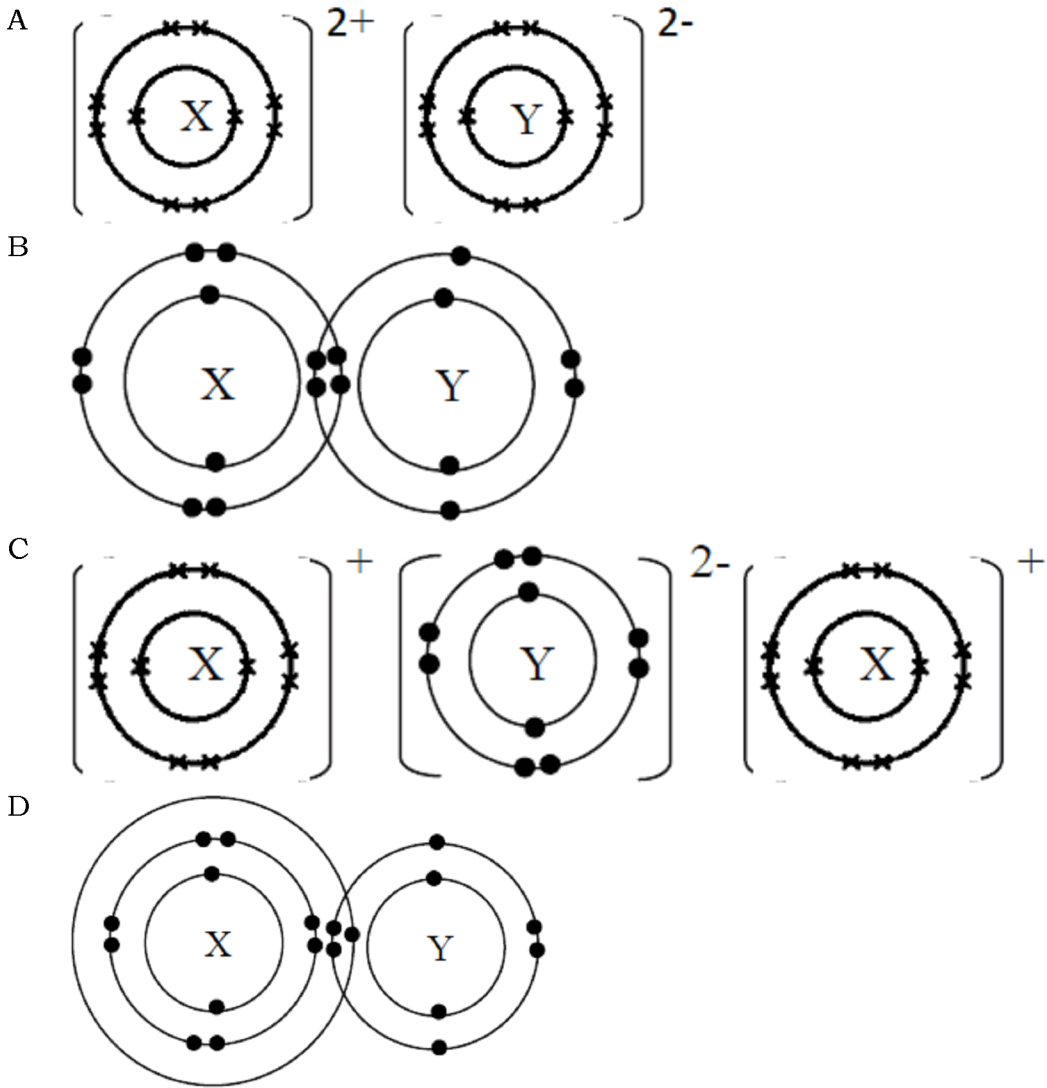
Which of the following represents the electron arrangement for a compound formed when element X reacts with element Y?



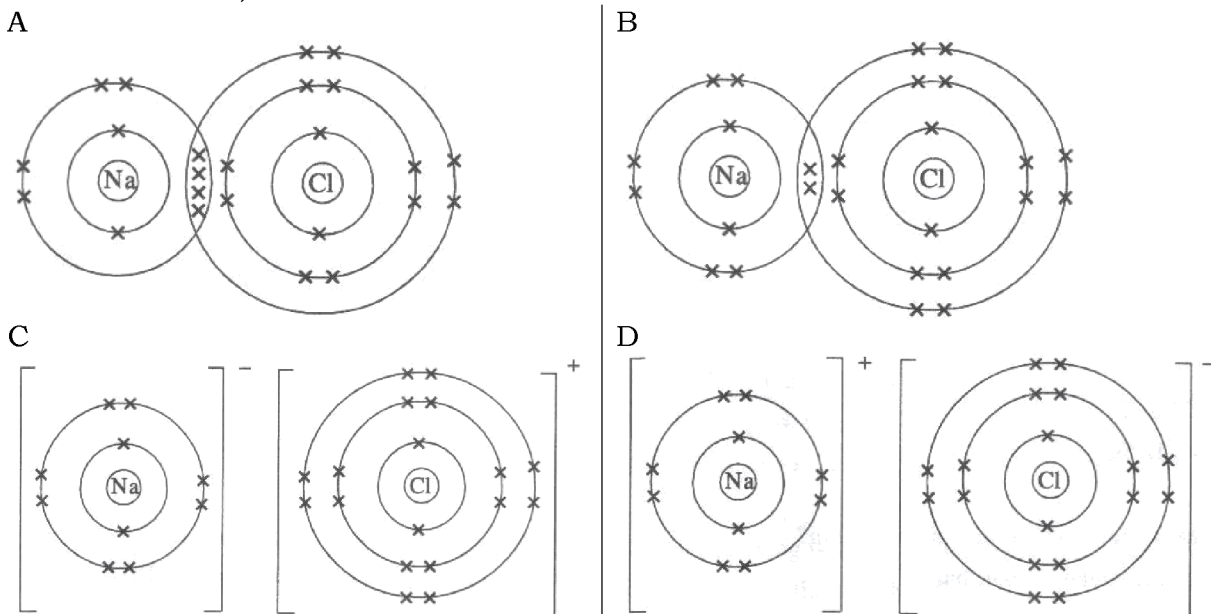
[SBPtrial10-16] Table 1 shows the proton number of elements X and Y.

Element	Proton number
X	11
Y	8

Which of the following shows the electron arrangement of the compound formed when element X reacts with element Y?



[SPM06-08] Which of the following represents the electron arrangement for the compound sodium chloride, NaCl?

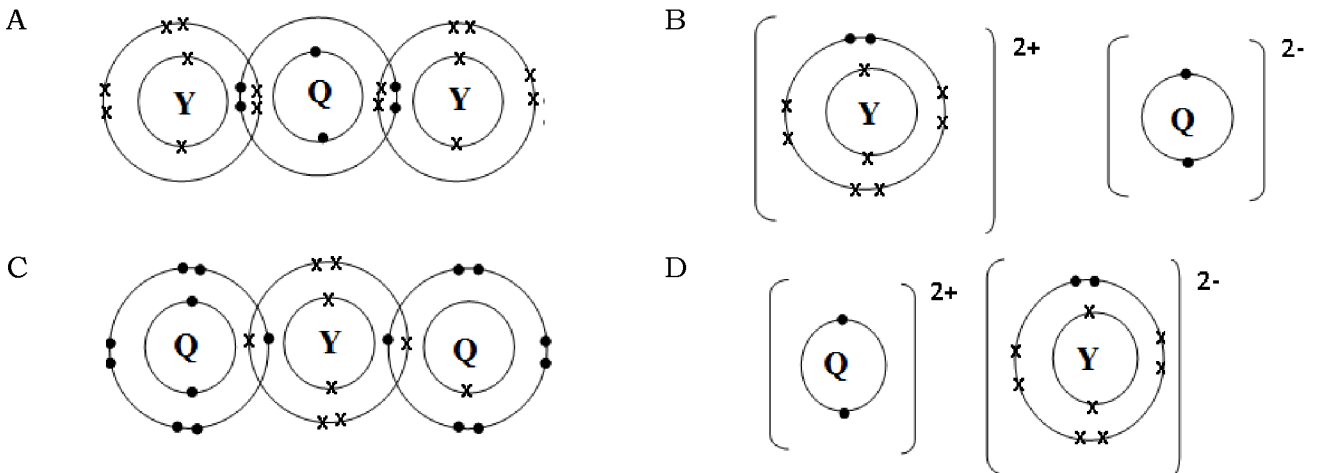


[MRS11-47] Diagram 19 shows the symbol for two elements. The letters used are not the actual symbol of the elements.

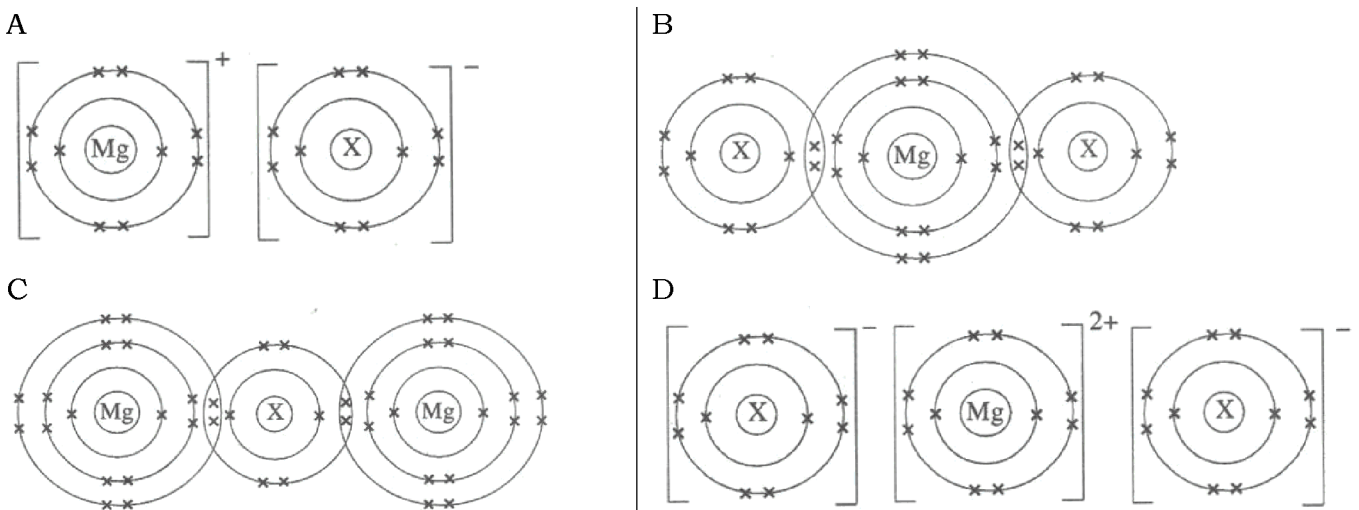


Diagram 19

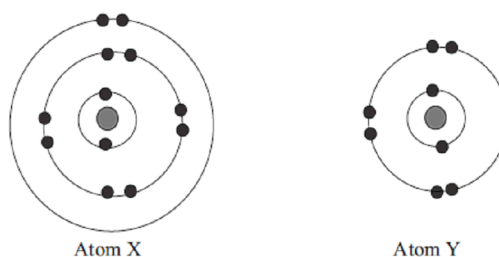
Which of the following represents the electron arrangement for a compound formed between elements Q and Y?



[SPM06-24] Element X and carbon combine to form compound CX₄. Element X and calcium combine to form compound CaX₂. The letter X is not the actual symbol of the element. Which of the following represents the electron arrangement for a compound formed between magnesium and element X?



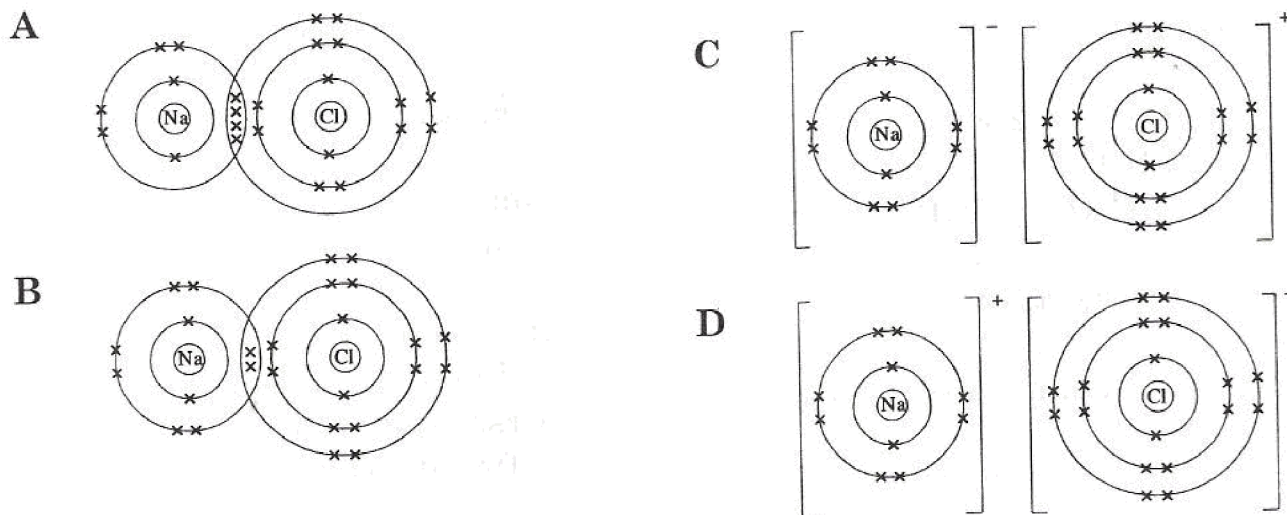
[MRS03-21]



Atom X can react with atom Y to form a compound. The formula of the compound formed will be

- A XY
- B X₂Y
- C Y₂X
- D Y₂X₂

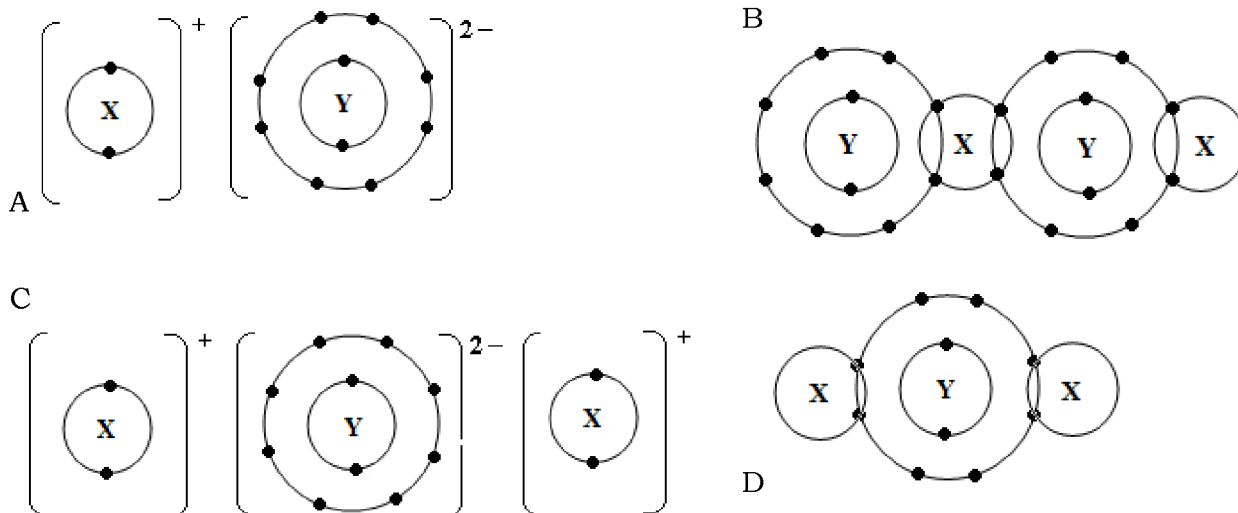
[SBPdiag08-12] Which of the following represents the electron arrangement for sodium chloride, NaCl? [Proton number; Na=11; Cl=17]



[SBPmidYearF508-35]The diagram shows the information of elements X and Y



Which of the following is the diagram of electron arrangement for the compound formed when element X reacts with element Y?



[SBPTrial07-30] The number of valence electrons of atoms X and Y are 2 and 7 respectively. Which of the following chemical formulae and types of bonding are true for the compound formed between X and Y?

	Chemical Formula	Type of Bonding
A	XY_2	ionic
B	XY_2	covalent
C	X_2Y	ionic
D	X_2Y	covalent

[SBPdiag06-21] Two elements P and Q have proton numbers of 12 and 17 respectively. Which of the following formulae and type of bond is true for the compound formed between elements P and Q?

	Formula	Types of bond
A	PQ_2	Ionic bond
B	P_2Q	Ionic bond
C	PQ_2	Covalent bond
D	P_2Q	Covalent bond

[SBPdiag07-12] The table below shows the proton number of elements M and N.

Element	Proton number
M	3
N	17

Which is true of the compound formed between elements M and N?

	Compound formula	Type of bond
A	MN	Ionic bond
B	MN	Covalent bond
C	M_2N_3	Ionic bond
D	M_3N_2	Covalent bond

[MRSM03-23]

Element	Electron Arrangement
V	2.8
W	2.8.2
X	2.8.4
Y	2.8.7
Z	2.8.8.1

Table 2

Table 2 shows the electron arrangement of atoms of elements V, W, X, Y and Z. Which of the pair of elements will combine to form a compound which will conduct electricity in molten state?

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

[SBPmidYearF508-05] The table shows the electron arrangement for elements M, N, P and Q.

Element	Electron arrangement
M	2.4
N	2.8.2
P	2.6
Q	2.8.7

Which of the following elements react to form an ionic compound?

- A M and P
- B P and Q
- C M and Q
- D P and N

[SPM09-09] Diagram 2 shows the positions of elements T, W, X, Y and Z in the Periodic Table. T, W, X, Y and Z are not the actual symbols of elements.

									Z
T							X	Y	
	W								

Diagram 2

Which of the following pairs of elements react to form an ionic compound?

- I X, Z
 - II T, Z
 - III T, Y
 - IV W, Y
- A I and II
 - B I and III
 - C II and IV
 - D III and IV

[SBPdiag08-04] Which of the following compounds have electrostatic forces between the particles?

- A Ammonia
- B Naphthalene
- C Iodine
- D Potassium oxide

[SBPmidYearF5-05] Among the following compounds, which one contains particles bonded by strong electrostatic forces?

- A Ammonia
- B Naphthalene
- C Carbon dioxide
- D Potassium oxide

[SBPmidYear06-20] Two different elements react to form a compound through transferring of electrons. Which of the following statements are true?

- I The chemical bond formed between the particles in the compound is strong.
 II Atom that loses electrons formed a negatively-charged ion.
 III Atom that gains electrons formed a positively-charged ion.
 IV Both the elements are non-metallic elements.
- A I and IV only
 B II and IV only
 C I, II and III only
 D I, II, III and IV

[SBPmidYear06-28] The table shows proton number of elements J and Q.

Element	Proton number
J	11
Q	8

What is the relative molecular mass of the compound formed between elements J and Q?
 [Relative atomic mass: Q=16, J=23]

- A 39
 B 55
 C 62
 D 78

[SPM04-43] The ionic formulae of elements X and Y are as follows:



The compound formed from the reaction of ions of elements X and Y has the formula X_2Y_3 . Which of the following ionic equations represents the reaction?

- A $X^{3+} + Y^{2-} \longrightarrow X_2Y_3$
 B $2X + 3Y \longrightarrow X_2Y_3$
 C $2X^{3+} + 3Y^{2-} \longrightarrow X_2Y_3$
 D $3X^{3+} + 2Y^{2-} \longrightarrow X_2Y_3$

[SBPTrial09-43] Diagram 14 shows the ionic formulae of elements A and B.



Diagram 14

Which of the following ionic equations represents the reaction between the ions?

- A $A^{3+} + B^{2-} \rightarrow A_2B_3$
 B $2A + 3B \rightarrow A_2B_3$
 C $2A^{3+} + 3B^{2-} \rightarrow A_2B_3$
 D $3A^{3+} + 2B^{2-} \rightarrow A_2B_3$

Covalent

[SPM08-06] What is the meaning of covalent bond?

- A A bond formed when metal atoms contribute electrons to each other to achieve a stable electron arrangement.
- B A bond formed when non-metal atoms share electrons to achieve a stable electron arrangement.
- C A bond formed by weak Van der Waals forces between the non-metal atoms.
- D A bond formed when a metal atom transfers an electron to a non-metal atom.

[MRSM11-07] Which substance is a covalent compound?

- A Sodium carbonate
- B Copper(II) nitrate
- C Hydrogen chloride
- D Tin(II) oxide

[SPM10-16] Which substance is a covalent compound?

- A Phosphorus(V) oxide
- B Sodium sulphate
- C Magnesium chloride
- D Lead(II) bromide

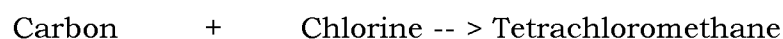
[MRSM09-06] Which substance is a covalent compound?

- A Hydrogen chloride
- B Sodium chloride
- C Magnesium oxide
- D Copper(II) oxide

[SBPTrial07-04] Which of the following substances is a covalent compound?

- A Copper
- B Ammonia
- C Lead(II) oxide
- D Sodium chloride

[MRSM06-25] The diagram shows the formation of a compound.



The bond in the compound is formed by

- A donation of electrons
- B sharing of electrons
- C receiving of electrons
- D exchanging of electrons

[SBPmidYear06-04] Which of the following is a covalent compound?

- A Lead(II) bromide
- B Calcium chloride
- C Aluminium oxide
- D Nitrogen dioxide

[SPM03-03] Butane in cooking gas burns to release carbon dioxide. Both butane and carbon dioxide are

- A ionic compounds
- B organic compounds
- C covalent compounds
- D hydrocarbon compounds

[SPM11-22] Diagram 5 shows the electrons arrangement in compound Z_2Y .

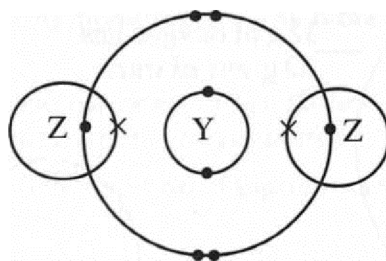


Diagram 5

Which elements are represented by Y and Z?

[Proton number : H = 1, C = 6, O = 8, Cl = 17]

	Y	Z
A	Carbon	Oxygen
B	Oxygen	Hydrogen
C	Hydrogen	Chlorine
D	Carbon	Chlorine

[SPM10-19] Table 2 shows the electron arrangements of atoms P, Q, R and S.

Atom	Electron arrangement
P	2.4
Q	2.8.1
R	2.8.2
S	2.8.7

Table 2

Which pair of atoms forms a compound by sharing electrons?

- A P and S
- B P and R
- C Q and S
- D Q and R

[SBPTrial2010-29] Table 3 shows information about five elements.

Element	J	K	L	M	N
Electron arrangement	2.4	2.8.1	2.8.3	2.8.6	2.8.7

Table 3

Each element in the table 3 can reacts each other. Which formula is covalent compound?

- A KN
- B J_4N
- C JM_2
- D LN_3

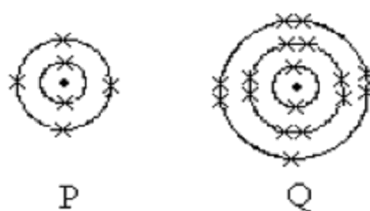
[MRS05-24] The number of valence electrons for atoms X and Y are 5 and 7 respectively. Which of the following chemical formula and type of bonding are true for the compound formed between X and Y?

	Chemical Formula	Type of bonding
A	XY_2	ionic
B	XY_2	covalent
C	XY_3	covalent
D	XY_3	ionic

[MRS09-39] Atom W has 14 protons while atom Z has 17 protons. Which of the following shows the formula and type of compound formed when atom W combines with atom Z?

	Formula	Type of Compound
A	WZ_2	Ionic
B	W_4Z	Covalent
C	WZ	Ionic
D	WZ_4	Covalent

[MRS06-38] The diagram shows the electron arrangement in an atom of elements P and Q.



What is the formula and type of bond for the compound formed when P reacts with Q?

	Formula	Bond
A	PQ_2	Ionic
B	PQ_4	Ionic
C	PQ	Covalent
D	PQ_4	Covalent

[SBPTrial08-38] The following statements are about atom G and J.

- Electron arrangement of atom G is 1
- Proton number of atom J is 6

What is the formula of the compound formed between G and J?

- A JG
- B JG_2
- C JG_3
- D JG_4

[SBPmidYear06-24] Electron arrangement of atom X is 2.6. Element Y is placed in Group 17 in the Periodic Table of Elements.

Which of the following statements is true about the compound formed between elements X and Y?

- A The formula of the compound is XY.
- B The compound consists of molecules.
- C The compound has a high melting point.
- D The compound is soluble in water and organic solvent.

[SBPdiag08-28 | SBPmidYearF5-19] The electron arrangement of atoms P and Q are 2.8.4 and 2.6 respectively. Which of the following statement is true about the formation of a compound between P and Q?

- A Each atom Q receives an electron from one atom P
- B Each atom P receives four electrons from one atom Q
- C Each atom P combines with two atoms Q by sharing of electrons
- D Each atom P combines with one atom Q by transfer of electrons

[SBPTrial09-16] The electron arrangements of atoms of elements P and Q are 2.4 and 2.6 respectively. Which of the following statements is true about the compound formed between P and Q?

- A Each atom Q receives an electron from one atom P
- B Each atom P receives four electrons from one atom Q
- C Each atom P combines with two atoms Q by sharing of electrons
- D Each atom P combines with one atom Q by transfer of electrons

[SBPdiag07-17] The electron arrangements of atoms of elements Y and Z are 2.8.4 and 2.6 respectively. Which of the following statements about formation of compound of P and Q is true?

- A Each atom of Z receives an electron from an atom of Y
- B Each atom of Y receives four electrons from an atom of Z
- C Each atom of Y combines with two atoms of Z by sharing of electrons
- D Each atom of Y combines with one atom of Z by transfer of electrons

[SBPTrial09-30] Diagram 10 shows the electron arrangement of a compound formed between atoms X and Y.

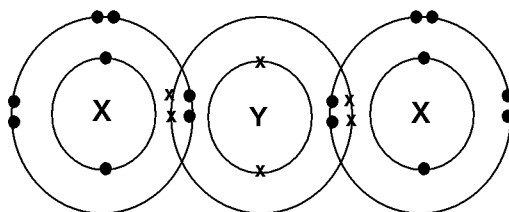


Diagram 10

Which of the following statements is true about the compound?

- A It is an ionic compound
- B The compound is formed by covalent bonds
- C The compound has a high boiling point
- D The compound is formed by electron transfer

[SBPdiag06-04] The electron arrangement of atom Y is 2.6. Atom Y can form covalent compound with another atom by

- A receiving two electrons
- B sharing two electrons
- C releasing six electrons
- D sharing two pairs of electrons

[SBPdiag06-28] The table shows the proton numbers of elements T, U, V, W and X.

Elements	Proton Number
T	3
U	6
V	14
W	17
X	18

Which of the following pairs of elements will form a covalent compound?

- A T and V
- B T and W
- C U and W
- D U and X

[SPM03-40 | SBPdiag07-09] The electron configuration of atom E is 2.8.7 and atom G has four valence electrons. What is the formula of the compound formed between E and G?

- A GE_2
- B GE_4
- C G_2E
- D G_4E

[SBPmidYearF508-25] The electron arrangement of atom J is 2.6 and atom G has 4 valence electrons. What type of bond and the chemical formula of the compound formed between atoms J and G?

	Type of bond	Chemical formula
A	Ion	JG_2
B	Ion	GJ_2
C	Covalent	GJ_2
D	Covalent	JG_2

[SBPdiag06-35] The proton number of atom A is 15. Atom Z has 7 valence electrons. What is the formula of the compound formed between A and Z?

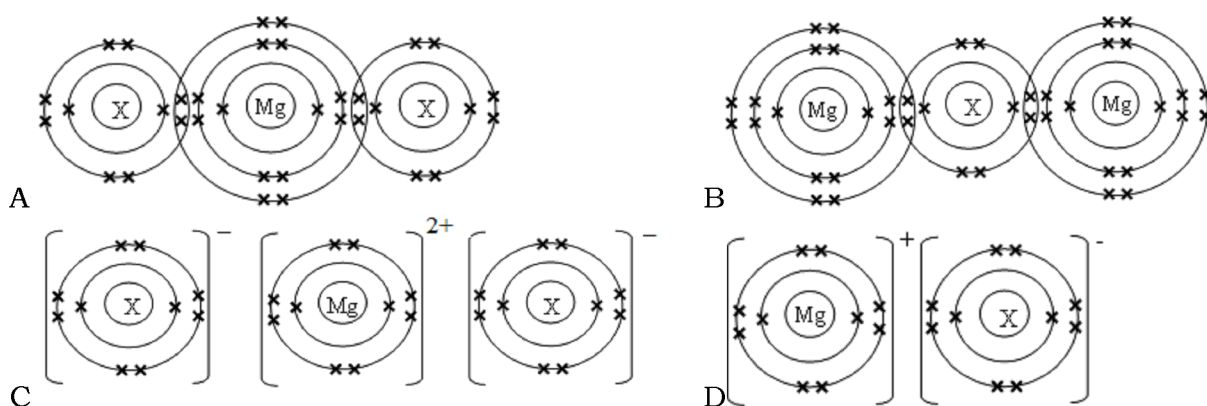
- A AZ_3
 B AZ_5
 C A_3Z
 D AZ_5

[MRSM07-26] Element X reacts with carbon and sodium to form compounds as shown in Table 5.

Reaction	Formula
Element X and carbon	CX_4
Element X and sodium	NaX

TABLE 5

Which of the following represents the electron arrangement for a compound formed between magnesium and element X?



[MRSM04-23] Figure 8 shows the electron configuration for compound YZ_2

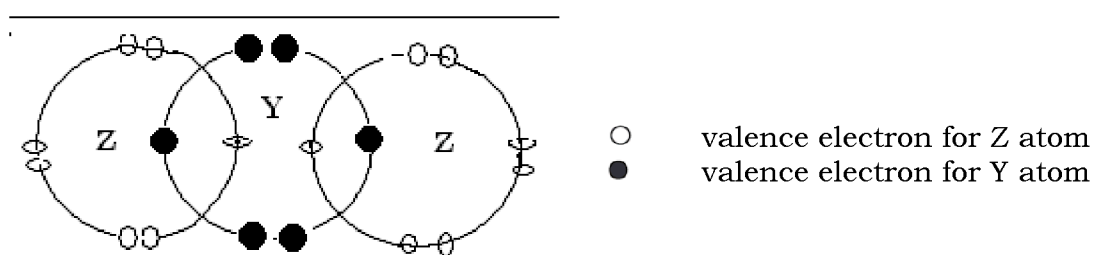
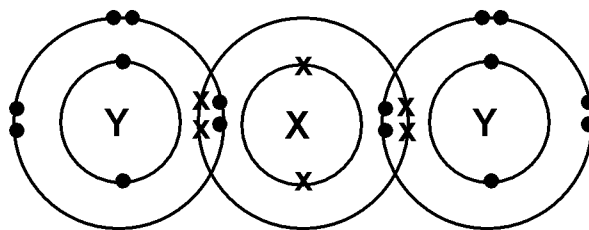


Figure 8

Which of the following pairs is the correct groups in which elements Y and Z belong to in the Periodic Table?

	Y	Z
A	2	17
B	16	17
C	14	16
D	17	16

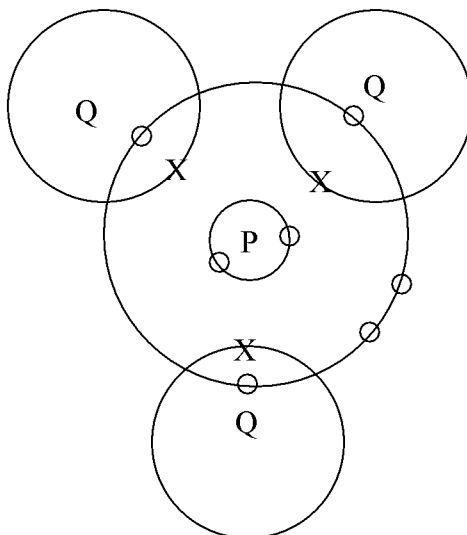
[SBPmidYear07F4-29] Diagram 6 shows the electron arrangement in a molecule formed from atoms X and Y.



Where is element Y placed in the Periodic Table of Elements?

	<u>Group</u>	<u>Period</u>
A	16	2
B	2	16
C	18	2
D	2	18

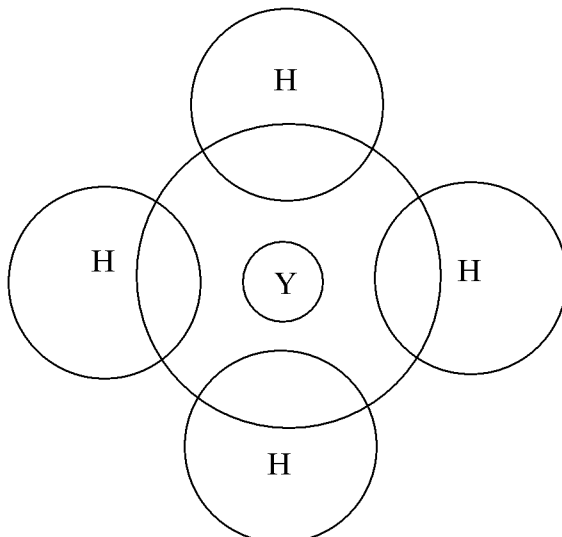
[SPM04-25] the diagram shows the electron arrangement of a compound formed between atoms P and Q.



Which of the following statements is true about the compound?

- A it is an ionic compound
- B the compound is formed by covalent bonds
- C the compound has a high boiling point
- D the compounds is formed by electron transfer

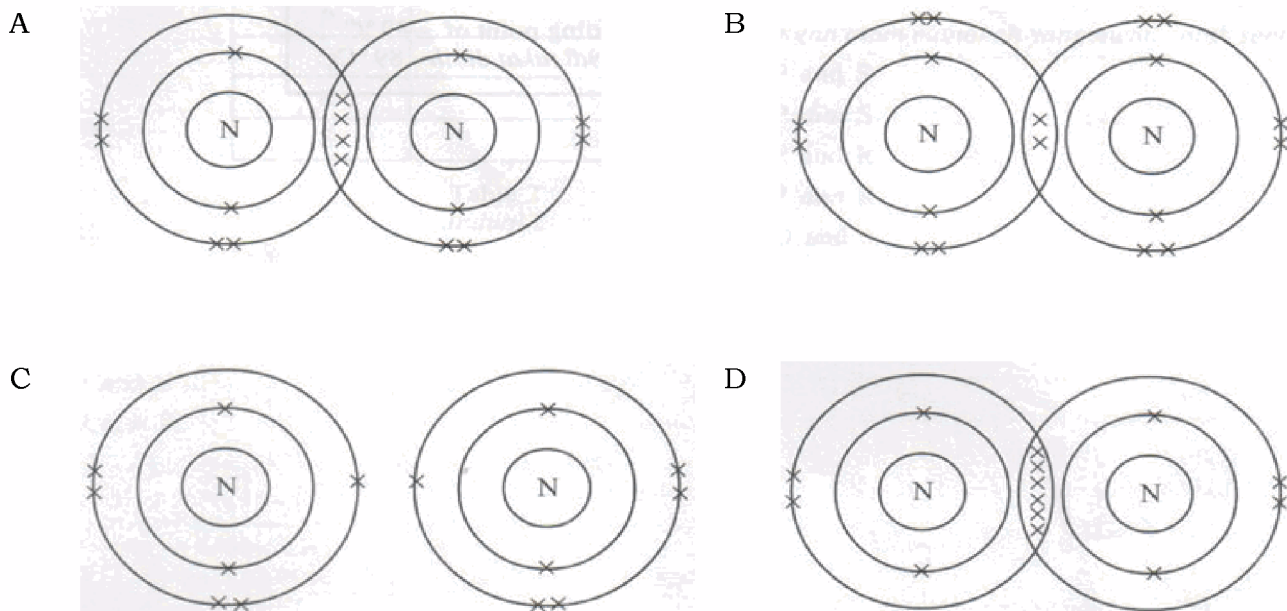
[SPM04-27] The diagram shows the electron shells in the substance formed between atoms of hydrogen and Y



What is the electron configuration of atom Y?

- A 2.4
- B 2.8
- C 2.8.4
- D 2.8.8

[SPM10-17] Which diagram shows the electron arrangement for the nitrogen molecule, N₂?
[Proton number: N=7]



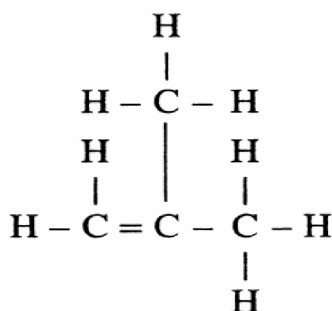
[SBPdiag07-22] How many electrons are shared in the bonding of an oxygen molecule?

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

[MRSM05-06] In liquid state oxygen molecules are held together by

- A Van der Waals forces
- B electrostatic force
- C covalent bonding
- D hydrogen bonding

[SBPmidYear06-40] An organic molecule has the structure as shown below.



Which of the following statement is true?

[Given that the proton number of C=6 and H=1]

- A The molecule has a total of 22 electrons.
- B Each carbon atom shares 4 electrons with other atoms.
- C Each hydrogen atom contributes 2 electrons for sharing.
- D The molecule has 11 single covalent bonds.

Properties of ionic compound

[MRSM04-40] Table 3 shows the proton number of four elements represented by letters P, Q, R and S.

Element	P	Q	R	S
Proton number	6	8	17	20

Which of the following pairs will form compounds with high melting and boiling points?

- A P and Q
- B Q and S
- C P and R
- D Q and R

[SBPtrial11-30] Which statement explains why ionic compound has high melting point?

- A Covalent bond between atoms is strong.
- B Electrostatic force between ions is strong.
- C There are free moving ions in the compound.
- D More energy is needed to overcome the forces between molecules.

[MRSM05-41] The table shows the proton number of five atoms U, V, W, X and Y.

Atom	Proton number
U	10
V	12
W	14
X	17
Y	19

Which of the following pairs formed a compound with high melting and boiling points?

- A U and W
- B V and Y
- C X and Y
- D W and X

[MRSM06-26] M is an ionic compound and dissolves in water to form a solution that conducts electricity. Which of the following could be compound M?

- A Sodium chloride
- B Hydrogen chloride
- C Carbon disulphide
- D Lead(II) chloride

[SPM05-03] Which of the following pairs of physical properties of sodium chloride is true?

	Solubility in water	Electrical conductivity when molten
A	Soluble	Conducting
B	Soluble	Not conducting
C	Insoluble	Conducting
D	insoluble	Not conducting

[SPM09-17] Compound X has the following properties.

- **Melting point 800 °C**
- **Soluble in water**
- **Conducts electricity in aqueous solution**

What is X?

- A Glucose
- B Naphthalene
- C Lead(II) bromide
- D sodium chloride

[MRSM07-25] Substance X has the following properties.

- **High melting point**
- **Conducts electricity in the molten state**
- **Insoluble in water**

Which of the following is substance X?

- A Silicon dioxide
- B Silver chloride
- C Mercury
- D Zinc Sulphate

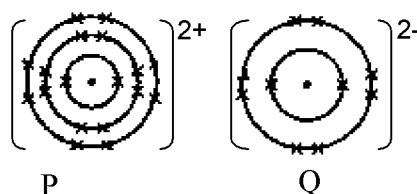
[SPM08-20] Which of the following is a property of potassium fluoride?

- A Volatile
- B Insoluble in water
- C Has a low melting point
- D Conducts electricity in the molten state

[SBPTrial08-16] Which of the following physical properties is true of copper(II) chloride?

- A It is a volatile substance
- B It dissolves in organic solvent
- C It conduct electricity in aqueous solution
- D It burns in oxygen to produce white fumes

[SBPmidYearF508-15] The diagram shows the electron arrangement of a compound formed between atoms P and Q.

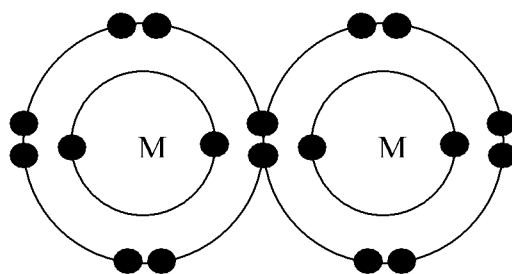


Which of the following statements is true about the compound?

- A There is strong intermolecular force between particles P and Q
- B The compound is formed by sharing the electrons
- C The compound conduct electricity in molten state
- D It is an covalent compound

Properties of covalent Compound

[SBPdiag07-27] The diagram shows the electron arrangement of a compound formed between two M atoms



Which of the following statements is true about the compound?

- A Consists of ions
- B Conduct electricity in molten state
- C The compound has a low melting point
- D Dissolves in water

[MRSM07-03] A covalent compound does not conduct electricity because

- A it does not dissolve in water
- B it has strong covalent bonding
- C particles consist of molecules
- D ions in the covalent compound are not mobile

[SBPdiag06-36] Covalent compounds do not conduct electricity because they consist of

- A neutral atoms
- B free moving ions
- C ions in fixed positions
- D covalent molecules only

[MRSM09-25] Elements M and N combined to form a compound which has the following characteristics.

- **Low melting point**
- **Does not dissolves in water**

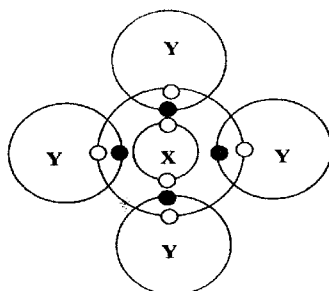
Which of the following is true about elements M and N?

- A M and N have equal number of electrons
- B Both M and N are transition metals
- C M is a metal and N is a non metal
- D Both M and N are non metals

[SBPmidYear07F4-18] Which of the following pairs of physical properties of compound W that is formed through transferring of electrons?

	<u>Solubility in water</u>	<u>Electrical conductivity when molten</u>
A	Soluble	Conducting
B	Soluble	Not conducting
C	Insoluble	Conducting
D	Insoluble	Not conducting

[SBPdiag06-12] The diagram shows the electron arrangement of a compound formed between atoms X and Y.



Which of the following statements is true about compound?

- A It is an ionic compound
- B The compound has a high boiling point
- C The compound is formed by covalent bonds
- D The compound is formed by electron transfer

[MRSM03-18] Which of the following are true of covalent compounds?

- I Usually volatile
- II Soluble in organic solvents
- III Formed by the sharing of electrons between atoms
- IV Conduct electricity in the melt

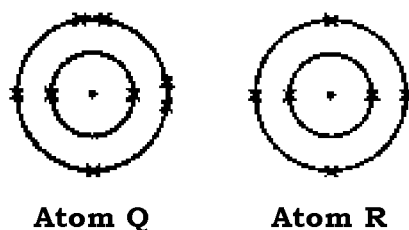
- A I and II only
- B III and IV only
- C I, II and III only
- D I, II, III and IV

[MRSM07-42] Which of the following statements are true about covalent compound?

- I Dissolve in water
- II Formed from reaction between metal and non metal elements
- III Formed from electron sharing between atoms
- IV Do not conduct electricity

- A I and II only
- B III and IV only
- C I, II and III only
- D I, II, III and IV

[SBPmidYearF508-24] The diagram shows the structure of atoms Q and R.



Which of the following is true about atoms Q and R?

- A Q exists as a diatomic molecule
- B Q and R have the same chemical properties
- C R reacts with Q to form an ionic compound
- D Q reacts with water to release hydrogen

[SBPmidYear07F4-39] Table 5 shows the proton number of elements E and G.

Element	Proton number
E	8
G	19

TABLE 5

Elements E and G combine to form a compound that

- A can conduct electricity in molten state
- B is soluble in organic solvents
- C has a low melting point
- D has a low density

[SBPdiag08-36] Diagram 2 shows the electron arrangement in a molecule formed between two Z atoms.

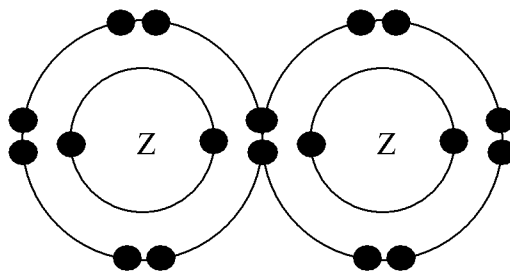
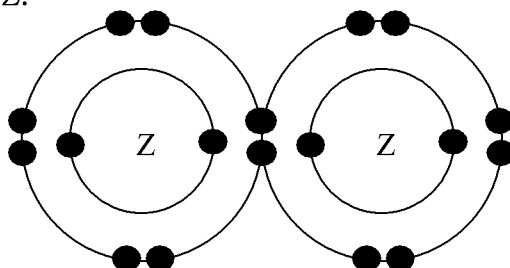


DIAGRAM 2

Which of the following statements is true about molecule Z_2 ?

- A Exists as solid at room temperature.
- B Conducts electricity in molten state.
- C Has a low melting point.
- D Dissolves in water.

[SBPmidYearF5-20] The diagram shows the electron arrangement of a substance formed between two atoms of Z.



Which of the following statements is true about the substance?

- A Consists of ions
- B Conduct electricity in molten state
- C The compound has a low melting point
- D Dissolves in water

Mix property

[MRSM11-06] Which of the following properties are true about an ionic compound?

	Melting point	Solubility in water
A	Low	Soluble
B	Low	Insoluble
C	High	Soluble
D	High	Insoluble

[MRSM10-24] Table 3 shows the electron arrangement of atoms J and L.

Atom	Electron arrangement
J	2.8.2
L	2.8.7

Table 3

Which of the following is true for the compound formed when J reacts with L?

	Type of bonding	Able to conduct electricity
A	Ionic	in aqueous and molten state
B	Covalent	in aqueous and molten state
C	Covalent	in aqueous state only
D	Ionic	in molten state only

[SBPtrial2010-41] Diagram 9 shows the symbols for two elements. The letters used are not the actual symbol of the elements.



X and Y react to form compound XY. Which of the following is true about XY?

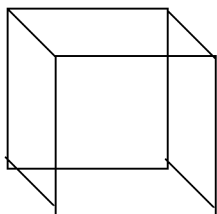
- A dissolve in tetrachloromethane
- B exist as a gas at room temperature
- C has high melting and boiling points.
- D do not conduct electricity in the solid and molten states.

[MRSM04-48] Which of the following statements are true regarding the magnesium chloride and hydrogen chloride?

- I Both are soluble in water producing colourless solutions.
- II Magnesium chloride has a higher melting point than hydrogen chloride.
- III Hydrogen chloride dissolves in methylbenzene while magnesium chloride does not.
- IV Solid magnesium chloride can conduct electricity while hydrogen chloride does not.

- A I and III only.
- B II and IV only.
- C I, II and III only.
- D I, II, III and IV

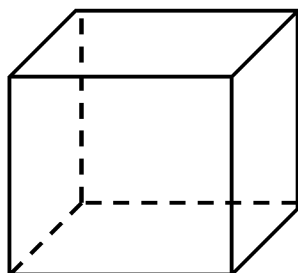
[SPM04-05] The diagram shows the crystalline structure of salt, NaCl.



Which of the following is not a characteristic of the crystal of NaCl?

- A it has sharp corners
- B it has flat surfaces
- C it has an acute angle between the two adjacent surfaces
- D it has straight edges between two adjacent surfaces

[SBPdiag07-49] The diagram shows the crystalline structure of salt, NaCl.



Which of the following is not a characteristic of the crystal of sodium chloride ?

- A It has sharp corners
- B It has flat surfaces
- C It has an acute angle between the two adjacent surfaces
- D It has straight edges between two adjacent surfaces

[MRSM11-24] Diagram 8 shows the electron arrangement of a compound.

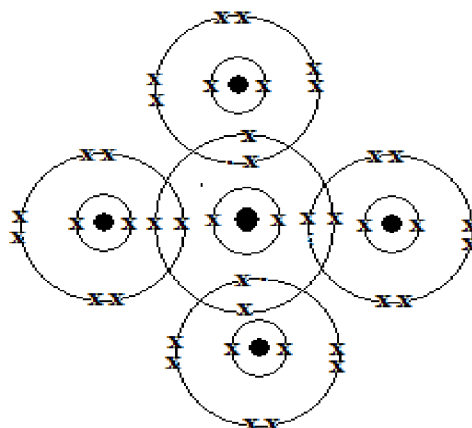


Diagram 8

Which of the following characteristics is true for the compound?

- A Can conduct electricity in molten and aqueous solution
- B Solid at room temperature
- C Low melting point
- D Soluble in water

Mix – Chemical Bonds

[MRS M11-39] Table 6 shows the electron arrangement of elements J, K, L, M and N.

Element	Electron arrangement
J	2.8
K	2.8.2
L	2.8.4
M	2.8.7
N	2.8.8.1

Table 6

Which of the following shows the correct chemical formula and type of bond for the compounds formed?

	Pair of elements	Chemical formula	Type of bond
A	K and N	KN ₂	Ionic
B	K and J	JK	Ionic
C	L and J	LJ	Covalent
D	L and M	LM ₄	Covalent

[MRS M10-38] An element J forms compound JCl₃ with chlorine and JSO₄ with sulphate ion. Which of the following is true for this element?

- A J is a transition metal
- B J is an alkali metal
- C J is a Group 2 element
- D J is halogen

[MRS M10-39] R reacts with S to form ionic compound with a formula of R₂S₃. Which of the following electron arrangements are true for R and S atoms?

	Electron arrangement of R atom	Electron arrangement of S atom
A	2.1	2.7
B	2.2	2.8.5
C	2.8.3	2.6
D	2.8.8.2	2.8.6

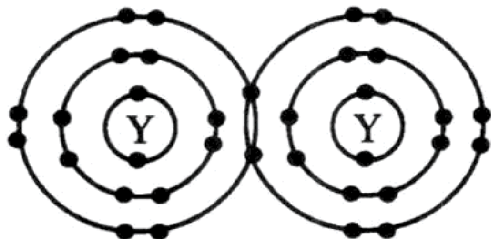
[MRS M03-37]

Element	Proton number
G	11
J	12
L	18
M	19

Table above shows the proton number for G, J, L and M. Which of the following is true?

- A Solid J conducts electricity.
- B G and M are in different groups in the periodic table.
- C G reacts with L to form an ionic compound.
- D M is a diatomic molecule

[SPM05-26] The diagram shows the electron arrangement in a molecule of element Y.



Where is element Y placed in the Periodic Table of elements?

	Group	Period
A	17	3
B	3	17
C	18	3
D	3	18

[SPM08-40] Diagram 8 shows the formation of bonds in a carbon dioxide molecule.

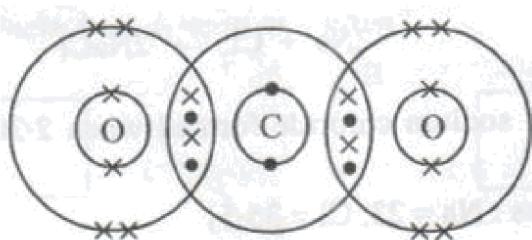


Diagram 8

Which statement is **not** true?

- A The oxygen atoms have six valence electrons
- B The carbon atom has a stable octet electron arrangement in the molecule
- C Each oxygen atom accepts two electrons from the carbon atom
- D The carbon atom forms a double covalent bond with each oxygen atom

[SPM04-22] The table shows the number of protons, electrons and neutrons of atoms Q and R.

Atom	number		
	proton	electron	Neutron
Q	11	11	12
R	12	12	12

Which of the following is true about atoms Q and R?

- A R can form diatomic molecule
- B Q and R have the same chemical properties
- C R reacts with Q to form an ionic compound
- D Q reacts with water to release hydrogen

[MRSM07-03] Which of the following substances has electrostatic forces between its particles?

- A Naphthalene
- B Carbon dioxide
- C Hydrogen chloride
- D Magnesium oxide

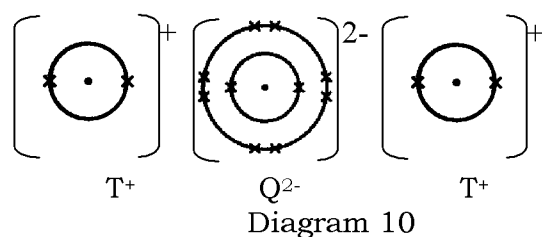
[SBPTrial07-43] The diagram below shows the symbols of atoms D and E



Atom D reacts with atom E to form a compound. Calculate the relative molecular mass for the compound formed.

- A 21
- B 43
- C 102
- D 113

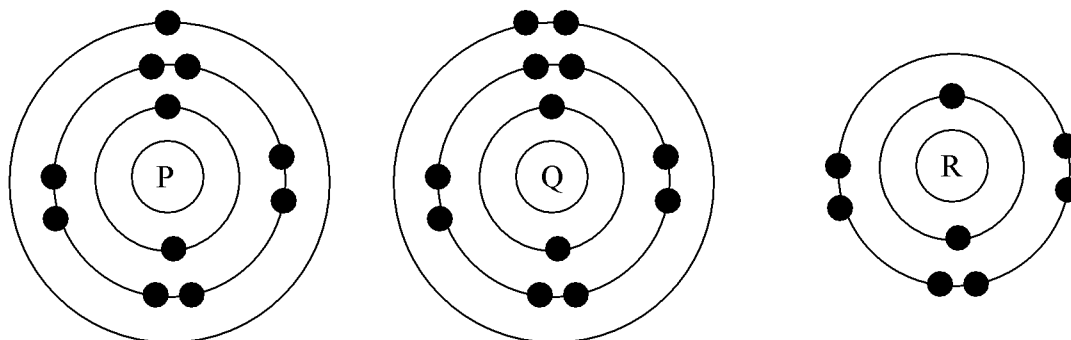
[SBPTrial08-30] Diagram 10 shows the electron arrangement of a compound formed between element T and element Q.



What group in the Periodic Table of Elements is element Q located?

- A 2
- B 8
- C 16
- D 18

[SBPmidYear06-36] The diagram shows the electron arrangement of atoms P, Q and R.



R can react with P and Q to form two different compounds. What are the formulae of the compounds formed?

	P and R	Q and R
A	P ₂ R	QR
B	P ₂ R	QR ₂
C	PR	QR ₂
D	PR ₂	QR ₂

[SBPmidYear07F4-25] Table 2 shows the nucleon number and the number of neutrons in of elements G and L.

Elements	Nucleon number	Number of neutron
G	19	10
L	35	18

TABLE 2

Which of the following is true about elements G and L?

- A G is more reactive than L.
- B G is more electropositive than L.
- C Both dissolves in water to form an alkaline solution.
- D Melting point of element G is higher than that of element L.

[SBPmidYear07F4-30 | SBPmidYearF5-24] Diagram 7 shows the symbols for two elements.



Diagram 7

Which of the following is true about elements X and Y?

- A Element X reacts with element Y to form a compound with the formula XY.
- B The compound formed from elements X and Y has a low melting point.
- C Both elements X and Y are monoatomic.
- D Element X cannot react with element Y.

[SBPdiag08-44] Table 3 shows the proton number of three elements X, Y and Z.

Element	X	Y	Z
Proton Number	12	8	17

TABLE 3

What is the formula of the substance and the type of bond formed between X, Y and Z?

	Formula	Type of Bond
I	XY	Covalent
II	YZ ₂	Covalent
III	XZ ₂	Ionic
IV	Z ₂	Covalent

- A IV only
- B III and IV only
- C II, III and IV only
- D I, II, III and IV

[SBPdiag08-20] Table 1 shows the proton number of elements M and N.

Element	Proton number
M	3
N	17

TABLE 1

Which of the following is true of the compound formed between elements M and N?

	Compound formula	Type of bond
A	MN	Ionic bond
B	MN	Covalent bond
C	M ₂ N ₃	Ionic bond
D	M ₃ N ₂	Covalent bond

[SBPmidYear07F4-38] Element Z and magnesium combine to form compound MgZ₂.

Which of the following represents the formula for a compound formed between carbon and element Z?

[Proton number of C=6]

- A CZ
- B CZ₂
- C CZ₃
- D CZ₄

[SBPmidYearF5-46] The table shows the number of electrons, proton number and number of neutrons for particles X and Y.

Particle	Number of electrons	Proton number	Number of neutrons
X	10	8	8
Y	7	7	8

Which of the following conclusions is correct for X and Y?

- A X is a positive ion
- B X and Y are isotopes
- C The mass of 1 mol of X is equals to 16g
- D Both X and Y are charged particles

Structure {Paper02}

[SPM10-04]

(a) Table 4.1 shows the proton number of three elements, X, Y and Z. The letters used do not represent the actual symbols of the elements.

Element	Proton number
X	6
Y	12
Z	17

Table 4.1

(i) Write the electron arrangement of: [2M]

Atom Y :

The ion of atom Z :

(ii) Write the formula of the compound formed between elements Y and Z. [1M]

.....

(iii) Element X react with element Z to form a covalent compound with a formula XZ_4 . State two physical properties of this covalent compound. [2M]

i.

ii.

(iv) Draw the electron arrangement of the compound XZ_4 . [2M]

(b) Table 4.2 shows some physical properties of two compounds, U and V.

Compound	Melting point (°C)	Boling point (°C)	Solubility in water	Solubility in organic solvent
U	800	1 420	Soluble	Insoluble
V	- 95	86	Insoluble	Soluble

Table 4.2

(i) State the physical state of the following compounds at room temperature. [2M]

U:

V :

(ii) State the type of compound for U. [1M]

.....

[SBPmidyearF508-01]

Figure 1 shows the location of seven elements A, D, E, G, J, L and M in the Periodic Table. These are not the actual symbols of the elements.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
A													D		E		G
																J	
L																	

Diagram 1

Using the letters in the Periodic Table of the elements in the Diagram 1, answer the following questions.

(a) (i) Which of the element is chemically unreactive? [1M]

.....

(ii) Give one reason for your answer in a(i). [1M]

.....

(b) When a small piece of element A is put into water, alkaline solution is formed and hydrogen gas is released.

(i) Write the chemical equation for the above statement. [1M]

.....

(ii) State one precaution that must be taken while carrying out the experiment using element A.

.....

(c) Arrange A, D, E, G, J and L according to the increase in size of the atom. [1M]

.....

(d) Why are elements A and L placed in the same group? [1M]

.....

(e) Element D reacts with element E to form a compound.

(i) Write the chemical formula of this compound. [1M]

.....

(ii) Draw the diagram of electron arrangement for the compound that is formed between D and E. [2M]

(iii) Why the compound in d (ii) cannot conduct electricity in any state. [1M]

.....

[SBPmidyearF407-06]

(a) Diagram 6 shows the electron arrangement of a molecule of a gas. N and H are symbols of two elements.

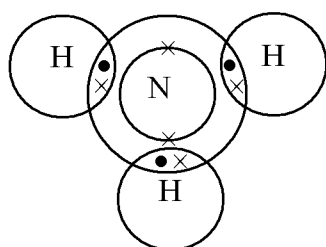


DIAGRAM 6

(i) What type of bond that holds the atoms together? [1M]

.....

(ii) What does the symbol “•x” represent? [1M]

.....

(iii) Name another compound which has the same type of bond as in (a)(i). [1M]

.....

(b) The electron arrangement of sodium atom is 2.8.1 and the electron arrangement of chlorine atom is 2.8.7. Sodium atom reacts with chlorine atom to form a compound.

(i) What happens to the valence electrons of sodium atom when it reacts with chlorine atom? [1M]

.....
 (ii) Write the formula for the compound formed.

.....
 (iii) Draw a diagram to show the electron arrangement of the compound formed between sodium atom and chlorine atom. [2M]

(c) Compare compound in (a) and (b).

(i) Which compound has a higher melting point? [1M]

.....
 (ii) Explain your answer in (c)(i). [2M]

.....

[SBPmidyearF406-06]

Two elements, X and Y can be reacted to form a compound. Figure 6 shows the electron arrangement of the particle in the compound.

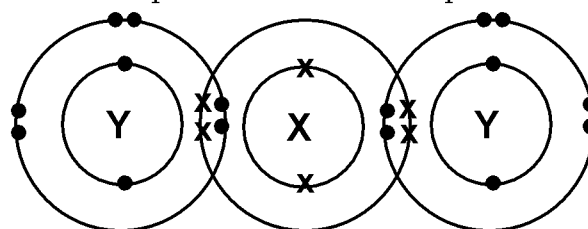


FIGURE 6

(a) What is the type of particle of this compound? [1M]

.....

(b) What is the proton number of element Y? [1M]

.....

(c) Write the formula of the compound. [1M]

.....

(d) Element Y can react with sodium, Na to form a compound.

(i) What type of the chemical bond is formed? [1M]

.....

(ii) Draw the electron arrangements of the compound. [2M]
Given that the proton number of sodium, Na is 11.

(e) (i) Compare the boiling points of the compound formed from element X and Y with compound formed from element sodium and Y. [1M]

.....

.....

(ii) Explain your answer in (e)(i) [3M]

.....

.....

.....

.....

[SBPdiag05-02]

The letters in Table 1 represent the element in the Periodic Table and it is NOT the actual symbol for any of the elements.

Element	A	B	C	D	E	F	G
Proton number	11	12	13	14	15	16	17

TABLE 1

Answer these question based on the above letters.

(a) Write down the electron arrangement for the element D. [1M]

.....

(b) Write down the formula of the ion formed by element F. [1M]

.....

(c) (i) Which of the elements reacts with cold water to produce hydrogen gas? [1M]

.....

(ii) Write down the chemical equation for the reaction in (c) (i). [1M]

.....

(d) Which of the elements is most electronegative? Give reasons for your answer. [2M]

.....

.....

.....

.....

(e) Element C can react with element G to produce a compound.

(i) Write the chemical formula for the compound. [1M]

.....

(ii) What type of chemical bonding is found in the compound? [1M]

.....

[SBPtrial05-01] {Translate}

Letters in the table 1 represent the elements in the Periodic Table of Elements

Element	R	S	T	U	V	W	X	Y
Proton Number	11	12	13	14	15	16	17	18
Electron arrangement		2.8.2			2.8.5			2.8.8

Table 1

(a) (i) What mean by 'period' in the Periodic Table of Elements? [1M]

.....

(ii) State which period for elements above located in the Periodic Table of Elements. Give your reason. [2M]

.....

.....

(b) State one elements exist as mono atomic gas at room temperature. [1M]

.....

(c) Elements R react very reactive with water to released hydrogen gas. Write the chemical equation the reaction. [1M]

.....

(d) Write the chemical formula of ion formed from element T. [1M]

.....

(e) How the oxide properties changing when cross the period form elements R to element X. [1M]

.....

(f) Element S and element X can react to formed one compound.

(i) What type of bond formed in the compound? [1M]

.....

(ii) Draw the electron arrangement for the compound formed at (f)(i). [2M]

[SBPtrial06-01] {Translate}

Table 1 below show the proton number and the number of electron for the elements **T**, **U**, **V**, **W** and **X**.

Elements	Proton Number	Number of Electrons
T	3	3
U	11	10
V	6	6
W	17	17
X	10	10

Table 1

By using the letters for elements in Table 1 above, answer the following questions:

(a) What mean by Proton number? [1M]

.....

(i) Write the chemical formula of ion for the element **U**. [1M]

.....

(ii) State the size of atom **T** compare to size of atom **U**. [1M]

.....

(iii) Explain your answer at (b)(ii). [1M]

.....

(b) U can react with **W** to form one compound.

(i) State the type of particle in the sompound formed. [1M]

.....

(a) Determine the group and period for element C in the Periodic Table. [1M]

.....

(b) Draw the electron arrangement of the compound formed between the atoms of Na and Cl. [2M]

(c) (i) The atoms of C and Cl can react with each other to form a compound X. Draw the electron arrangement of the compound X formed. [2M]

(ii) Diagram 3 shows the setup of apparatus to investigate the conductivity of liquid compound X.

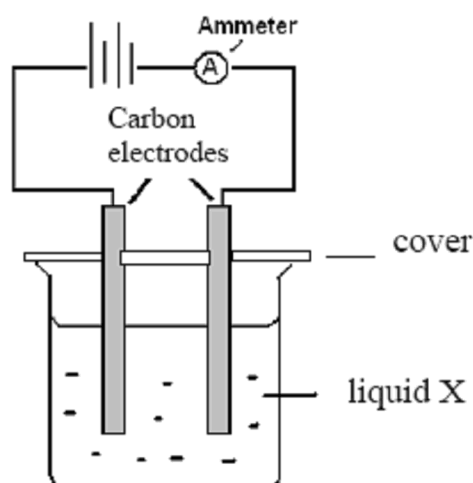


Diagram 3

State **one** observation and give a reason for it. [2M]

.....

(d) F atom is more reactive than Cl atom. Explain why. [3M]

.....

.....

.....

[MRSM04-02]

Diagram 1 shows the elements in period 3 of the Periodic Table.

1							18		
	2			13	14	15	16	17	
	Na	Mg		Al	Si	P	S	Cl	Ar

Diagram 1

Based on Diagram 1, answer the following questions:

(a) State an example of metal. [1M]

.....

(b) The size of the Al atom is bigger than the P atom. Explain. [2M]

.....

.....

(c) The elements Mg and S can react with oxygen to form their oxides.

(i) Write the formulae of the oxides formed. [1M]

.....

(ii) Compare the chemical properties of these oxides. [1M]

.....

.....

(d) Magnesium can react with chlorine to form a compound.

(i) Draw the electronic configuration diagram for the compound formed. [2M]

(ii) State a physical property of the compound formed. [1M]

.....

[SPM08-02]

Table 2.1 shows a group of elements.

19 F 9 Fluorine	35 Cl 17 Chlorine	80 Br 35 Bromine	127 I 53 Iodine
---------------------------------	-----------------------------------	----------------------------------	---------------------------------

Table 2.1

(a) In which group of the periodic Table are these elements located? [1M]

.....

(b) Write the electron arrangement for an atom of fluorine? [1M]

.....

(c) Fluorine atoms are smaller than chlorine atoms.
Explain why fluorine forms a negative ion more easily than chlorine. [2M]

.....

.....

(d) State the type of chemical bond in an iodine molecule. [1M]

.....

(e) Chlorine reacts with sodium to form a compound.

(i) State the type of chemical bond in this compound. [1M]

.....

(ii) Draw a diagram to show the electron arrangement in this compound. [2M]
[Proton number of Na=11]

(f) Table 2.2 shows three pairs of chemicals.

Chemicals		
KI _(aq)	+ Cl _{2(aq)}	
KCl _(aq)	+ Br _{2(aq)}	
KBr _(aq)	+ KCl _(aq)	

Table 2.2

Put a tick (✓) in the box beside the pair of chemicals which will undergo a displacement reaction. [1M]

[SPM07-04]

Table 4 shows the electrical conductivity and melting point of substance P, Q, and R.

Substance	Electrical conductivity in the state of			Melting point / °C
	solid	molten	Aqueous	
P	No	No	No	< - 110
Q	No	No	No	80 – 90
R	No	Yes	Yes	> 800

Table 4

(a)(i) State the types of structure and bonding of substance P. [2M]

Structure :

Bonding :

(ii) Explain why substance P has a low melting point. [1 M]

.....

(b) State how the bonds are formed in

(i) Substance Q. [1M]

.....

(ii) Substance R. [1M]

.....

(c) State why the electrical conductivity of substance R is different in solid state compared to the molten and aqueous states. [2M]

Solid state :

Molten and aqueous states :

(d) Based on the information in Table 4, fill in the following blanks. [3M]

Substance is soluble in water.

Substance and substances are insoluble in water.

[SPM06-03]

(a)(i) The electron arrangement for argon is 2.8.8.

Why is this element very stable and not reactive? [1M]

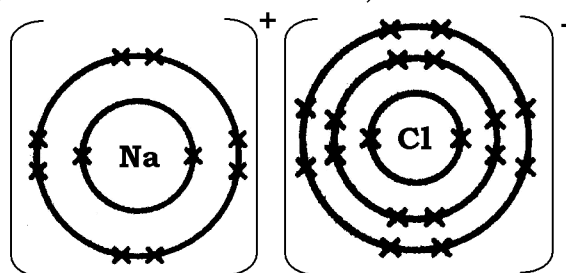
.....

(ii) Name **one** other element that has the same stability as argon. [1M]

.....

(b) Atoms of both sodium and chlorine are unstable.

They react to form an ionic compound which more stable. Diagram 3.1 shows a sodium chloride compound, NaCl, that is produced by the formation of an ionic bond between a sodium ion, Na⁺ and d chloride ion, Cl⁻.



(i) How are a sodium ion and a chloride ion formed from their respective atoms? [2M]

Sodium ion :

Chloride ion :

(ii) Name the force that exists between these ion in the compound. [1M]

.....

(iii) The melting point of sodium chloride, NaCl is 801 °C and its boiling point is 1413 °C. What will happen to the ions in this compound at 900 °C ? [1M]

.....

(iv) Give **one** reason for your answer in 3 (b)(iii). [1M]

.....

(c) Diagram 3.2 shows the proton number and the nucleon number for two elements, X and Y.

The letters used do not represent the actual symbols of the elements.



Diagram 3.2

Draw a diagram to show the bonding formed between elements X and Y. [3M]

Essay {Paper02}

[SPM11-10]

(a) Element X reacts with oxygen to form a compound. The compound formed does not conduct electricity in all conditions.

State the name of element X and the type of bond formed in the compound.

Write a balanced chemical equation for the reaction. [4M]

(b) Table 10 shows the proton number of elements P, Q, R and S.

Element	P	Q	R	S
Proton number	6	8	19	20

Table 10

Based on Table 10, choose two elements that form a compound with a high melting point and a high boiling points.

Explain how the compound is formed and draw the electron arrangement for the compound. [10M]

(c) Diagram 10 shows a flow chart when substance C is dissolved in two different solvent, water and solvent D, and the properties of solutions formed.

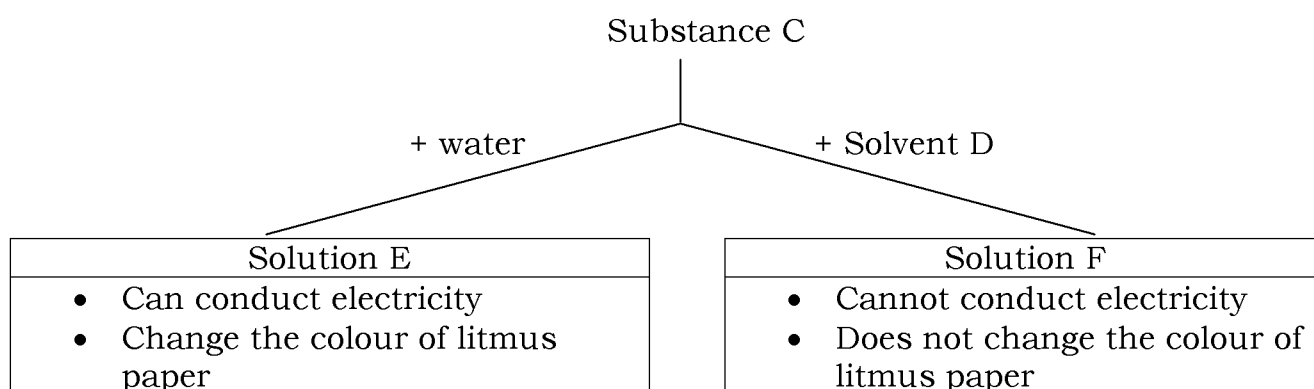


Diagram 10

(i). Suggest substance C and solvent D. [2M]

(ii). Explain the differences in properties between solution E and solution F. [4M]

-----oooOO aĐaŽ OOooo-----

[MRSM11-07B]

(b) Diagram 7.2 shows the standard representation for three elements, P, Q and R.

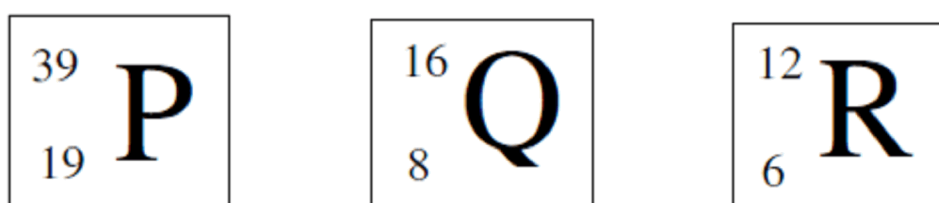


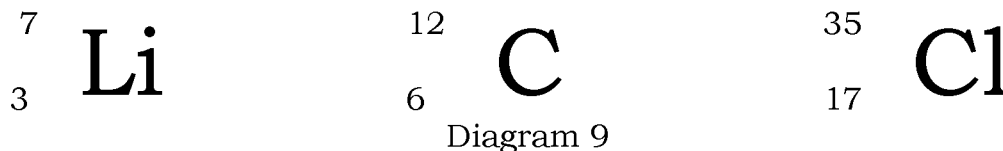
Diagram 7.2

Elements P, Q and R react to form two compounds that have different type of bonds. Using the information in Diagram 7.2, suggest and explain how the two compounds can be formed. [10M]

-----oooOO aĐaŽ OOooo-----

[MRSM10-09c]

(c) Diagram 9 shows the standard representation for the atoms of three elements; Li, C and Cl.

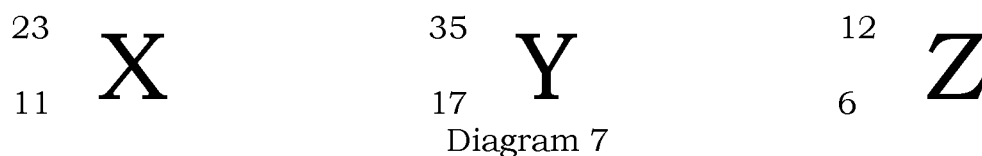


Using the given information, describe the formation of two compounds with different types of bonding. [10M]

-----oooOO aĐaŽ OOooo-----

[SBPmidyearF508-07]

Diagram 7 shows the chemical symbols which represent three elements X, Y and Z. These letters are not the actual symbols of the elements.



(a) What is meant by: [2M]

- (i) Ionic compound
- (ii) Covalent compound

(b) Explain the formation of the bond that is formed between [12M]

- (i) element X and element Y.
- (ii) element Y and element Z.

(c) The melting point of magnesium oxide is much higher than methylbenzene. Explain why. [6M]

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[SBPTrial2010-07a]

(a) Element X react with element Y to form a compound. Diagram 7.1 shows the electron arrangement of the compound.

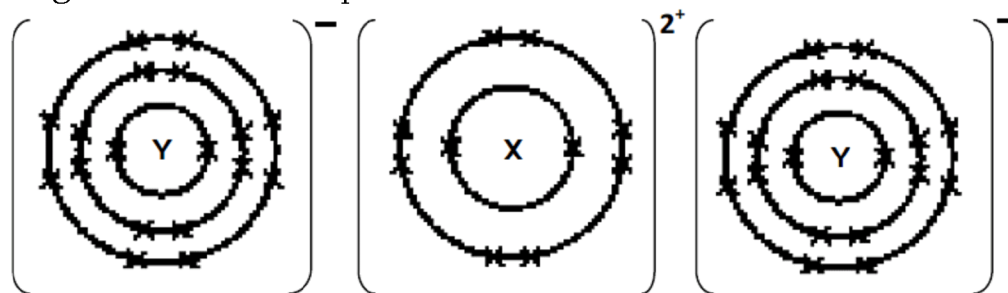


Diagram 7.1

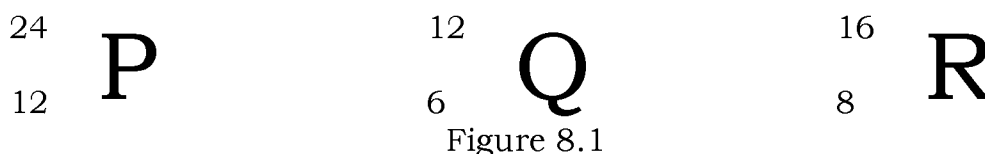
(i) Write the electron arrangement of atom of element X. State the position of element X in the Periodic Table of Element. [3M]

(ii) Write the chemical equation for the reaction between element X and element Y. Explain how the bond in the compound formed. [7M]

-----oooOO aĐaŽ OOooo-----

[SBPmidyearF507-08]

Figure 8.1 shows the chemical symbols which represent three elements, P, Q and R. These letters are not the actual symbols of the elements.



(a) Write the electron arrangement for atoms P and Q. [2M]

(b) Using the information in the Figure 8.1, explain how two different compounds can be formed from the following pairs of elements.[12M]

- (i) P and R
(ii) Q and R

(c) Table 8.2 shows the melting and boiling points of two chemical compounds at room temperature.

Compound	Melting Point (°C)	Boiling Point (°C)
Tetrachloromethane	- 23	76.8
Aluminium oxide	2030	2970

Table 8.2

Compare the melting and boiling points of tetrachloromethane and aluminium oxide. Explain why the two compounds have different physical states at room temperature. [6M]

-----oooOO aĐaŽ OOooo-----

[SBPdiag08-08]

Table 8.1 shows the electron arrangement for atoms P, Q and R.

Element	Electron arrangement
P	2.8.1
Q	2.8.7
R	2.4

TABLE 8.1

(a) The reaction between atoms of P and Q form an ionic compound whereas the reaction between atoms of Q and R forms a covalent compound. Based on the above statement, explain how these ionic and covalent compounds are formed. [12M]

(b) Table 8.2 shows the melting point and boiling point of two chemical compounds at room temperature.

Compound	Melting Point (°C)	Boiling Point (°C)
M	- 23	76.8
N	2030	2970

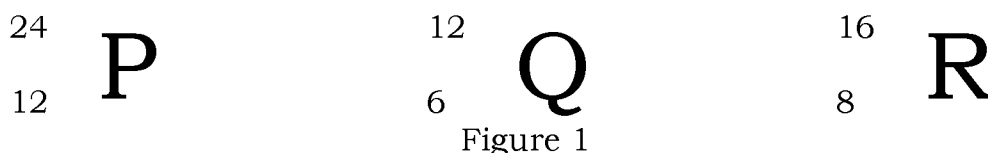
TABLE 8.2

Explain the differences in the melting point and boiling point of compound M and N with respect to the types of particles present and the types of bonding. [8M]

-----oooOO aĐaŽ OOooo-----

[SBPdiag07-07]

Figure 1 shows the chemical symbols which represent three elements, P, Q and R. These letters are not the actual symbols of the elements.



(a) Name the chemical bond formed between [2M]

- (i) P and R
- (ii) Q and R

(b) Using the information in the Figure 1, explain how two compounds can be formed from these elements. The two compounds should have different bond types [12M]

- (i) P and R
- (ii) Q and R

(c) The melting point of sodium chloride is much higher than that of tetrachloromethane. Explain why? [6M]

-----oooOO aĐaŽ OOooo-----

[SBPdiag06-08b]

(b) Table 8.1 shows the proton number of magnesium, chlorine and carbon.

Element	Magnesium	Chlorine	Carbon
Proton number	12	17	6

TABLE 8.1

(i) Carbon reacts with chlorine to form a compound.

What type of compound formed?

Draw the electron arrangement to show the chemical bond in the compound. [3M]

(ii) Describe how ionic bond is formed between magnesium and chlorine atoms. [7M]

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[SBPdiag05-essay01]

Figure 1 shows three atom for element P, Q, and R.

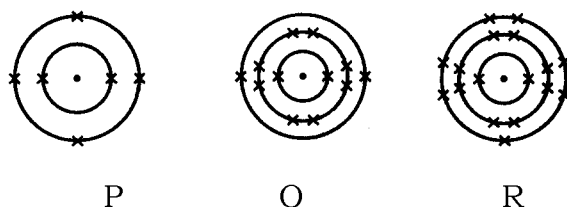


FIGURE 1

(a) (i) State the position of element Q in the Periodic Table.

(ii) R has 18 neutrons. State the nucleon number of atom R and write the symbol to represent atom R in the form of a_zX . [4M]

(b) Element Q forms a compound when reacts with element R.

Based on the electron arrangement, explain how the compound is formed. [8M]

(c) Element P also forms compound when reacts with element R.

Table below shows the physical state for compound formed between the reaction P and R and between the reaction Q and R.

Compound	Compound formed between P and R	Compound formed between Q and R
Physical state at room temperature and pressure	Colourless liquid	White solid

Compare the melting points for both compounds.

Explain why the melting points between both compounds are different. [8M]

-----oooOO aĐaŽ OOooo-----

[SBPtrial05-07] {Translate}

Diagram 1 shows the symbol for element Y and element Z.



Diagram 1

- (a) Determine the position of these elements in the Periodic Table of Elements. [4M]
- (b) What the different between the element Y and element Z at [4M]
- (i) Size of atom and
- (ii) Electronegativity

Explain the reason for the different exist between the element Y and element Z.

- (c) Element Y and element Z can react. State the chemical formula of compound that formed and names the bond was formed. [2M]
- (d) Explain the formation bond for compound was produced between element Y and element Z. [7M]

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[SBPtrial06-07]{Translate}

Table 7 show the arrangement of electron for element **K**, **L**, **M** and **N**.

Elements	Electrons Arrangement
K	2.1
L	2.8.1
M	2.8.7
N	2.4

Table 7

- (a) Compare the reactivity of element K and element L when react with water. Explain your answer. [4M]
- (b) State the type of bond and explain how the formation was formed between [12M]
- (i) L and M
- (ii) M and N
- (c) State two physical property for compound was formed in (b)(i). [2M]
- (d) Element X in group 8 and period 4 in the Periodic Table element. State two special characteristic for element X. [2M]

-----oooOO aĐaŽ OOooo-----

[SBPtrial08-08]

Table 8 shows the proton number of atoms of elements W, X, Y and Z.

Element	Proton Number
W	1
X	3
Y	6
Z	8

Table 8

(a) State the arrangement of elements X, Y and Z in the order of increasing atomic radius. Explain your answer. [4M]

(b) The reaction between elements X and Y form a chemical compound. Explain the formation of this compound. [6M]

(c) The reaction between elements Z and W form another chemical compound.

(i) Draw the electron arrangement of the compound formed. [2M]

(ii) Compare two physical properties below for the compounds formed in (b) and (c).

- Melting point
- Electric conductivity.

Explain the differences in each physical property. [8M]

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[SBPtrial09-08]

Diagram 8 shows the electron arrangement of a compound formed between element Q and element R.

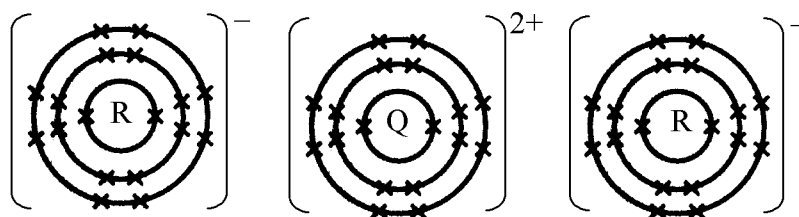


Diagram 8

(a) Explain the position of R in the Periodic Table of Elements. [4M]

(b) Based on Diagram 8, explain how the compound is formed. [7M]

(c) Element R can also react with carbon, C to form a compound. [3M]

(i) Write the formula of the compound formed.

(ii) Draw the electron arrangement of the compound formed.

(d) The compounds formed in (b) and (c) have different physical properties. Explain the differences between the two compounds based on: [6M]

- (i) Melting point
- (ii) Electrical conductivity

-----oooOO aĐaŽ OOooo-----

[MRSM09-07]

Diagram 7 shows the symbol of three elements.



(a) Write the electron arrangement for atom O. Explain the position of the element in the Periodic Table of Elements. [5M]

(b) Both elements C and Mg can react with O to form different compounds. Explain the formation of the compounds between:

- C and O
- Mg and O

In your answer, include the type of bonds and the electron arrangement diagram of the compounds formed. [10M]

(c) Compare the electrical conductivity and melting points of the compounds formed in (b). Explain their differences.

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[MRSM07-07]

(a) Table 7.1 shows information on the atomic structure and the relative atomic mass of three elements: aluminium, carbon and oxygen.

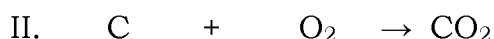
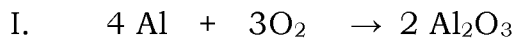
Element	Number of proton	Number of neutron	Relative atomic mass
Carbon	6	6	12
Oxygen	8	8	16
Aluminium	13	14	27

Table 7.1

(i) Based on Table 7.1, state the relationship between the relative atomic mass of an element with the number of proton and neutron of its atom. [1M]

(ii) Draw the electronic arrangement diagram for an ion of oxygen. [2M]

(iii) Aluminium and carbon react with oxygen to form aluminium oxide and carbon dioxide respectively. The reactions are represented by the following equations.



Describe how chemical bonds in aluminium oxide and carbon dioxide are formed. [8M]

(b) Naphthalene and sodium chloride are white crystals at room temperature. Table 7.2 shows two physical properties of the compounds.

Compound	Melting point /°C	Electrical conductivity
Naphthalene	80	Non electrolyte
Sodium chloride	801	Electrolyte

Table 7.2

Explain the differences in the melting points and the electrical conductivity of naphthalene and sodium chloride.

Your answer should be based on the [5M]

- types of particles present in both compounds
- types of bonds and
- forces of attraction

(c) Diagram 7 shows the symbol of two atoms of oxygen.



Diagram 7

Compare and contrast the two atoms of oxygen. [4M]



[MRSM03-07c,d] c5

Compound	Melting point (°C)	Boiling point (°C)
M	801	1420
N	-117	78

Table 3

(c) Table 3 shows the melting and boiling points of compounds M and N. explain the differences in the boiling and melting points of compounds M and N with respect to the types of particles present and the types of bonding. [8M]

Atom	Electron arrangement
Sodium	2.8.1
Chlorine	2.8.7
Carbon	2.4

Table 4

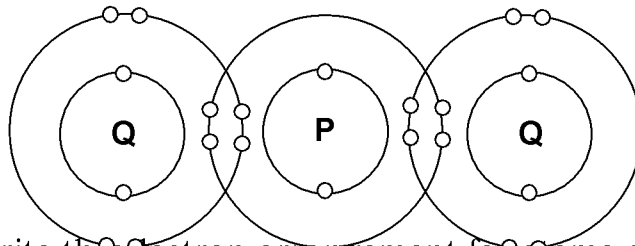
(d) Based on table 4, draw an electronic structure for the compound formed between: [4M]

- (i) sodium and chlorine
 (ii) carbon and chlorine

-----oooOO aĐaŽ OOooo-----

[SPM05-10b,c]

(b) Figure 10.1 shows the electron arrangement of molecule PQ₂. These letters are not the actual symbols of the elements.



Based a Figure 10.1, write the electron arrangement for atoms of element P and element Q. Explain the position of element Q in the Periodic Table of the Elements. [6M]

(c) Table 10.2 shows the electron arrangement for atoms W, X and Y. These letters are not the actual symbols of the elements.

Element	Electron arrangement
W	2.4
X	2.8.7
Y	2.8.8.2

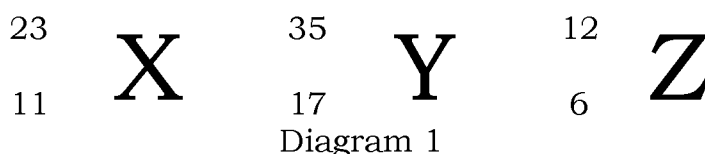
Table 10.2

Using the information in Table 10.2, explain how two compounds can be formed from these elements based on their electron arrangements. The two compounds should have different bond types. [10M]

-----oooOO aĐaŽ OOooo-----

[SPM04-07]

Diagram 1 shows the chemical symbols which represent three elements, X, Y and Z.



(a) (i) Write the electron arrangement of atoms X and Y. [2M]

(ii) State the number of neutrons in an atom of element Z and write the symbol for an isotope of element Z. [2M]

(b) The reaction between atoms of X and Y forms an ionic compound whereas the reaction between atoms of Y and Z forms a covalent compound.

Based on the above statement, explain how these ionic and covalent compounds are formed. [8M]

(c) The ionic compound formed from the reaction between elements X and Y is able to conduct electricity when it is melted or dissolved in water.

Describe how you could prove that this statement is correct. [8M]

-----oooOO aĐaŽ OOooo-----