

Girls' High School & College, Prayagraj

Worksheet No. : 3

Session : 2020-21

Class : X A, B, C, D, E, F

Subject : Chemistry

Instructions: Parents are expected to ensure that the student spends 2 days to read and understand the chapter according to the book and websites referred and thereafter answer the given questions.

Note: Chapter- Chemical Bonding

Book: Concise Chemistry by Dr. S. P. Singh (Selina Publication)

Websites: <https://youtu.be/-jezzq-y7r8> & <https://youtu.be/ZcmzabBVLh8>

Answer the following questions:

(1) Fill in the blanks:

- (a) When the nuclei of two reacting atoms are of _____ mass, then a bond so formed is called _____ covalent bond.
(equal/ unequal/ polar/ non -polar)
- (b) In case of non-polar covalent bond, the covalent bond is formed in the _____ of atoms and shared electrons are distributed _____.
(corner/middle/ equally/ unequally)
- (c) Ionic or electrovalent compounds do not conduct electricity in their _____ state.
(fused/solid)
- (d) The ions in _____ compounds are held very strongly due to strong _____ forces.
(electrovalent/ covalent/ electromagnetic/ electrostatic)
- (e) In covalent compounds, the bond is formed due to _____ of electrons.
[sharing/ transfer]

- (f) Electrovalent compounds have a _____ boiling point.
[low/high]
- (g) A molecule of _____ contains a triple bond.
[hydrogen/ ammonia/ nitrogen]
- (h) _____ is a polar covalent compound.
(CH₄ / N₂ / H₂ / NH₃)
- (i) Coordinate bond is also known as _____.
(ionic bond / dative bond)
- (j) Water molecule is polar due to the difference in _____ between hydrogen and oxygen.
(electron affinity / electronegativity)
- (k) Low _____ and high electron affinity favour ionic bond formation.
(ionization potential / electronegativity difference)
- (l) A molecule of water combines with a _____ to form a hydronium ion.
(hydrogen atom / hydrogen ion)
- (m) Element M forms a chloride with the formula MCl₂ which is a solid with high melting point. M would most likely be in the group in which _____ is placed.
(Na / Mg / Al / Si)

(2) Choose the correct answer:

- (a) The property which is characteristic of an electrovalent compound is that:
- (i) it is easily vaporized
 - (ii) it has a high melting point
 - (iii) it is a weak electrolyte
 - (iv) it often exists as a liquid
- (b) When a metal atom becomes an ion,
- (i) it loses electrons and is oxidized
 - (ii) it gains electrons and is reduced
 - (iii) it gains electrons and is oxidized
 - (iv) it loses electrons and is reduced

(c) Metals lose electrons during ionization. This change is called:

- (i) Oxidation
- (ii) Reduction
- (iii) Redox
- (iv) Displacement

(d) Among the compounds, identify the compound that has all three bonds [ionic, covalent and coordinate bond].

- (i) Ammonia
- (ii) Ammonium chloride
- (iii) Sodium chloride
- (iv) Calcium chloride

(e) State which is not a typical property of an ionic compound.

- (i) High m.p.
- (ii) Conducts electricity in molten and aqueous state
- (iii) Are insoluble in water
- (iv) Exist as oppositely charged ions even in the solid state

(f) Compound 'X' consists of only molecules. 'X' will have :

- (i) Crystalline hard structure
- (ii) A low m.p. and low b.p.
- (iii) An ionic bond
- (iv) A strong force of attraction between its molecules

(g) The compound with high melting point is:

- (i) KCl
- (ii) HCl
- (iii) CH₄
- (iv) NH₃

(h) A covalent bond is likely to be formed between two elements which:

- (i) have similar electronegativities
- (ii) have low ionization energies
- (iii) have low electron affinity
- (iv) are placed in group 1 and group 2

(3) Compound X consists of molecules. Choose the correct answer from the options given below:

(a) The type of bonding in X will be:

- (i) ionic
- (ii) electrovalent
- (iii) covalent
- (iv) coordinate

(b) X is likely to have a :

- (i) low melting point and high boiling point
- (ii) high melting point and low boiling point
- (iii) low melting point and low boiling point
- (iv) high melting point and high boiling point

(c) In the liquid state, X will :

- (i) become ionic
- (ii) be an electrolyte
- (iii) conduct electricity
- (iv) not conduct electricity

(4) Give a reason for each of the following :

- (a) Hydrogen chloride can be termed as a polar covalent compound.
- (b) Covalent compounds exist as gases, liquids or soft solids.
- (c) Carbon tetrachloride does not dissolve in water.

(5) The following table shows the electronic configuration of the elements W, X, Y, Z:

Element	W	X	Y	Z
Electronic configurations	2, 8, 1	2, 8, 7	2, 5	1

Answer the following questions based on the above table :

(a) What type of bond is formed between:

- 1. W and X
- 2. Y and Z

(b) What is the formula of the compound formed between:

- 1. X and Z
- 2. W and X

(6) By drawing an electron dot diagram show the formation of hydronium ion. State the type of bonding present in it.

(7) Elements Q and S react together to form an ionic compound.

- (a) Under normal conditions, which physical state will the compound QS exist in?
- (b) Can Q and S both be metals? Justify your answer.

(8) Give two examples in each case:

- (a) Co-ordinate bond compounds
- (b) Gaseous polar compounds
- (c) Gaseous non-polar compounds

(9) Draw an electron dot diagram of each of the following:

- (a) Ammonium ion
- (b) Calcium oxide
- (c) Sodium chloride
- (d) Methane
- (e) Ammonia
- (f) Nitrogen

(10) State the type of bond formed, when the combining atoms have:

- (a) zero electronegativity difference
- (b) small electronegativity difference
- (c) large electronegativity difference

END