

CHEMICAL BONDING
Assignment Sheet

1. Copy and complete the following table :

	Sodium	Phosphorus
(a) Formula of chloride.		
(b) Physical state of chloride at room temperature (i.e., solid, liquid or gas).		
(c) Nature of bonding in chloride (i.e., ionic or covalent).		

2. (a) What type of bonding will be present in the oxide of the element with atomic number 1?
 (b) How many electrons are present in the valence shell of the element with atomic number 18?
 (c) What is the electronic configuration of the element in the third period which gains one electron to change into an anion? **[2003]**
3. (a) What kind of particles will be found in a liquid compound which is a non-electrolyte?
 (b) Cations are formed by (loss/gain) of electrons and anions are formed by (loss/gain) of electrons. (Choose the correct words to fill in the blanks)
 (c) Explain how electrolysis is an example of redox reaction? **[2004]**
4. Element X is a metal with a valency 2. Element Y is a non-metal with a valency 3.
 (a) Write equations to show how X and Y form ions.
 (b) If Y is a diatomic gas, write the equation for the direct combination of X and Y to form a compound. **[2004]**
5. Electrons are getting added to an element Y.
 (a) Is Y getting oxidized or reduced?
 (b) What charge will Y have after the addition of electrons? **[2005]**
6. (a) Acids dissolve in water to produce positively charged ion. Draw the structure of these positive ion.
 (b) Explain why carbon tetrachloride does not dissolve in water.
 (c) Elements Q and S react together to form an ionic compound. Under normal conditions, which physical state will be compound QS exist in?
 (d) Can Q and S both be metals? Justify your answer. **[2005]**
7. Identify the following reactions as either oxidation or reduction:
 (a) $O + 2e^- \longrightarrow O^{2-}$
 (b) $K - e^- \longrightarrow K^+$
 (c) $Fe^{3+} + e^- \longrightarrow Fe^{2+}$ **[2006]**

8. (a) What is a lone pair of electrons?
(b) Draw an electron dot diagram of a hydronium ion and label the lone pair of electrons.
(c) Name a neutral covalent molecule which contains one lone pair of electrons. **[2006]**
9. (a) Name the charged particles which attract one another to form electrovalent compounds.
(b) The electronic configuration of nitrogen is 2, 5. How many electrons in the outer shell of a nitrogen atom are not involved in the formation of a nitrogen molecule?
(c) In the formation of magnesium chloride (by direct combination between magnesium and chlorine), name the substance that is oxidized and the substance that is reduced.
(d) In the formation of electrovalent compounds, electrons are transferred from one element to another. How are electrons involved in the formation of a covalent compound? **[2007]**
10. What are the terms defined below?
(a) A bond formed by a shared pair of electrons, each bonding atom contributing one electron to the pair.
(b) A bond formed by a shared pair of electrons with both electrons coming from the same atom. **[2008]**
11. Fill in the blanks with the correct words from the brackets.
Generally ionic compounds exist in (a) (solid/liquid/gas) state. Melting and boiling points of covalent compounds are generally (b) (low/ high). **[2009]**
12. Select the correct answer from the choices A,B,C and D which are given.
During ionization metals lose electrons, this change can be called :
(A) Oxidation (B) Reduction (C) Redox (D) Displacement **[2010]**
13. By drawing an electron dot diagram, show the lone pair effect leading to the formation of ammonium ion from ammonia gas and hydrogen ion. **[2011]**
14. Draw an electron dot diagram of the structure of hydronium ion. State the type of bonding present in it. **[2012]**
15. There are three elements E, F, G with atomic numbers 19, 8 & 17 respectively. Give the molecular formula of the compound formed between E & G & state the type of chemical bond in this compound. **[2012]**
16. Give suitable chemical terms for the following:
A bond formed by a shared pair of electrons with both electrons coming from the same atom. **[2013]**
17. Choose the most appropriate answer from the following options:
(i) Among the following compounds identify the compound that has all three bonds (ionic, covalent and coordinate bond)
(A) Ammonia (B) Ammonium chloride
(C) Sodium hydroxide (D) Calcium chloride. **[2013]**

- (ii) Which of the following is not a typical property of an ionic compound ?
(A) High melting point.
(B) Conducts electricity in the molten and in the aqueous solution state.
(C) They are insoluble in water.
(D) They exist as oppositely charged ions even in the solid state. **[2013]**
18. Compare the compounds carbon tetrachloride and sodium chloride with regard to solubility in water and electrical conductivity. **[2013]**
19. Choose the correct answer from the options given below :
(i) A compound X consists of only molecules. Hence X will have :
(A) A crystalline hard structure
(B) A low melting point and low boiling point
(C) A ionic bond
(D) A strong force of attraction between its molecules. **[2014]**
- (ii) The molecule containing a triple co-valent bond is :
(A) ammonia (B) methane
(C) water (D) nitrogen **[2014]**
20. Give one word or phrase for the following :
Formation of ions from molecules. **[2014]**
21. Answer the following questions:
(i) Explain the bonding in methane molecule using electron dot structure.
(ii) The metal of Group 2 from top to bottom are Be, Mg, Ca, Sr, and Ba.
(1) Which one of these elements will form ions most readily and why?
(2) State the common feature in the electronic configuration of all these elements. **[2015]**
22. Choose the most appropriate answer from the following list of oxides which fit the description. Each answer may be used only once:
[SO₂, SiO₂, Al₂O₃, MgO, CO, Na₂O]
(i) A basic oxide.
(ii) An oxide which dissolves in water forming an acid.
(iii) An amphoteric oxide.
(iv) A covalent oxide of a metalloid. **[2015]**
23. An element L consists of molecules.
(i) What type of bonding is present in the particles that make up L?
(ii) When L is heated with iron metal, it forms a compound FeL. What chemical term would you use to describe the change undergone by L? **[2015]**
24. Fill in the blanks with the choices given in brackets.
Electrovalent compounds have _____(high / low) melting points. **[2016]**
25. Choose the correct answer from the options given below:
An element with the atomic number 19 will most likely combine chemically with the element whose atomic number is :
A. 17 B. 11
C. 18 D. 20 **[2016]**

26. 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 table above:

- (i) What type of Bond is formed between:
 1. W and X 2. Y and Z
- (ii) What is the formula of the compound formed between:
 1. X and Z 2. W and X **[2016]**
27. By drawing an electron dot diagram show the formation of Ammonium Ion [Atomic No.: N=7 and H=1] **[2016]**
28. Fill in the blanks from the choices given in brackets:
 The compound that does not h.e a lone pair of electrons is _____
 (water, ammonia, carbon tetra chloride) **[2017]**
29. Which of the following is a common characteristic of a covalent compound?
 1. high melting point
 2. consists of molecules
 3. always soluble in water
 4. conducts electricity when it is in the molten state **[2017]**
30. Match the atomic number 2, 4, 8, 15, and 19 with each of the following :
 (i) A solid non metal belonging to the third period.
 (ii) A metal of valency 1.
 (iii) A gaseous element with valency 2.
 (iv) An element belonging to Group 2.
 (v) A rare gas. **[2017]**
31. State the type of Bonding in the following molecules :
 (i) Water
 (ii) Calcium oxide **[2017]**
32. Draw an electron dot diagram to show the formation of each of the following compounds:
 (i) Methane
 (ii) Magnesium Chloride
 [H = 1, C = 6, Mg = 12, Cl = 17] **[2017]**

