



CHEMISTRY

BOOKS - MAXIMUM PUBLICATION

CHEMICAL BONDING

Example

1. What peculiarity do you see in the electronic configuration of noble elements except Helium?



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2. The electronic configuration of some element are given below

Is the number of electrons in the outermost shell of these elements the same as that of the elements in the Table

Element	Atomic mass	Electronic configuration
Magnesium	12	2,8,2
Oxygen	8	2,6
Sodium	11	2,8,1
Chlorine	17	2,8,7

(Table 2.2)



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3. The electronic configuration of some element are given below

you are familiar with the compounds of these

elements. Write the names of some compounds?

Element	Atomic mass	Electronic configuration
Magnesium	12	2,8,2
Oxygen	8	2,6
Sodium	11	2,8,1
Chlorine	17	2,8,7

(Table 2.2)

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4. The electronic configuration of some element are given below

How the atoms in these compounds held together.

Element	Atomic mass	Electronic configuration
Magnesium	12	2,8,2
Oxygen	8	2,6
Sodium	11	2,8,1
Chlorine	17	2,8,7

(Table 2.2)

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5. What is meant by Chemical Bonding?

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6. In the formation of sodium chloride which atoms are combining.

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7. How many electrons are there in the outermost shell of sodium atom?

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8. How many electrons are there in outermost shell of chlorine?

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9. How do chlorine and sodium attain stability?

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10. Analyze the electron transfer in each atom during the formation of sodium chloride.

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11. Draw the electron dot diagram of the transference of electron sodium atom and chlorine atom. The diagram represent only electrons in the outermost shell because they are the only electrons participating in chemical bonding.



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12. Complete Table 2.3 by examining the arrangement of electrons before and after the chemical reaction during the formation of sodium chloride.

Which atom donates electron? How many electrons?

	Sodium		Chlorine	
	Before chemical reaction	After the chemical reaction	Before chemical reaction	After the chemical reaction
Electronic Configuration	2, 8, 1	2, 8	2, 8, 7	2, 8
Number of electrons	11	10	17	18
Number of protons	11	11	17	17
Charge	Charge-less	positive charge	charge-less	negative charge



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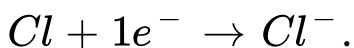
13. Complete Table 2.3 by examining the arrangement of electrons before and after the chemical reaction during the formation of sodium chloride.

Which atom accepts electron? How many electrons?

	Sodium		Chlorine	
	Before chemical reaction	After the chemical reaction	Before chemical reaction	After the chemical reaction
Electronic Configuration	2, 8, 1	2, 8	2, 8, 7	2, 8
Number of electrons	11	10	17	18
Number of protons	11	11	17	17
Charge	Charge-less	positive charge	charge-less	negative charge

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14. Electron transfer during the formation of sodium chloride can be written in the form of an equation



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15. Define Ionic Bond?

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16. How the ionic bond formation of sodium oxide is represented?

[Hint: Atomic No. of sodium 11, oxygen 8]

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17. Draw the electron dot diagram of following compounds. [Hint: Atomic No. No.]

$Na = 11, F = 9, Mg = 12]$

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18. Define ionic compounds?

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19. Write the atomic number of flourine?

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20. The electronic configuration of Flourine

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21. How many electrons are required for one fluorine atom to attain the octet?



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22. Is there a possibility of transferring electrons from one fluorine atom to another fluorine atom?



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23. How can the two flourine atoms attain an octect arrangement?

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24. The manner in which the two flourine atoms in a flourine molecule undergo chemical bonding is

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25. What happens during the formation of flourine molecule electron transfer or electron sharing?

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26. How many pairs of electrons are shared?



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27. How covalent bonds are formed?



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28. How single bonds are formed?



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29. Write down the electronic configuration?

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30. Draw the electron dot diagram of the formation of chlorine molecule by combining two chlorine atoms?

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31. Examine the diagram illustrating the chemical bonding in the molecule of oxygen and nitrogen.

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32. Draw the chemical bond formation of hydrogen chloride [HCl]

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33. How many electron pairs are shared?

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34. Represent chemical bond by using symbols?

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35. Examples of some covalent compounds are given draw the chemical bonds of the compound by using electron dot diagram.



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36. Examples of some covalent compounds are given draw the chemical bonds of the compound by using electron dot diagram.



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37. Examples of some covalent compounds are given draw the chemical bonds of the compound by using electron dot diagram.



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38. Define electronegativity?

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39. Who proposed the electronegativity scale?

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40. Consider the case hydrogen chloride molecule



What is the electronegativity of hydrogen?



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41. Consider the case hydrogen chloride molecule



What is the electronegativity of chlorine?



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42. Consider the case hydrogen chloride molecule
 $[HCl]$

The atomic nucleus of which of these elements has a greater tendency to attract the shared pair of electrons?

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43. Consider the case hydrogen Chloride molecule
 $[HCl]$

The chlorine atom with a higher electronegativity attract the shared pair of electrons towards its nucleus. As a result the chlorine atom in hydrogen

chloride develops a partial negative charge δ^- (delta negative) and hydrogen atom develops a partial positive charge δ^+ (delta positive) it can be represented below.

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44. Explain the properties of ionic compounds and covalent compounds.

Properties	Ionic compound	Covalent compounds
State	Solid	Found in the three states solids, liquids and gases
Solubility in water	soluble in water	Insoluble in water. But soluble in organic solvent like kerosene, benzene etc.
Electrical Conductivity	conduct electricity in fused or solution state	Do not conduct Electricity
Melting point Boiling point	High	Generally Low



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45. What is meant by valency?



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46. In the formation of sodium chloride-sodium donated one electron, chlorine accepts one electron write the valencies of each element?



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47. In the formation of magnesium oxide- How many electrons are donated by magnesium?

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48. How many electrons are accepted by oxygen?

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49. How is valency and electron transfer related in this case?

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50. In the formation of hydrogen chloride, how many electron pairs are shared?

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51. What will be the valency of each atom?

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52. Why does the number of chlorine atoms differ in these compounds? Try to find out by analysing the valency of the elements Na , Al , Cl and C .

Analyse Table

Examine the above table and identify how to write the chemical formula from valency. Compare your findings with the following. First write the element with lower electronegativity. Exchange the valency of each element and write as suffix. Divide the suffix with the common factor. If the suffix is 1, it need not be written.

Element	Valency	Chemical formula of compound	
Na Cl	1 1	Na ₁ Cl ₁	NaCl
Mg O	2 2	Mg ₂ O ₂	MgO
Al Cl	3 1	Al ₁ Cl ₃	AlCl ₃
C C ₁	4 1	C ₁ Cl ₄	CCl ₄
C O	4 2	C ₂ O ₄	CO ₂



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53. Complete the table given below and answer the following questions (symbol used are not true)

Which element in the table is the most stable one?

Justify your answer.

Element	Atomic number	Electronic configuration
P	9	2,7
Q	17
R	10
S	12



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54. Complete the table given below and answer the following questions (symbol used are not true)

Which element donates electrons in chemical

reaction?

Element	Atomic number	Electronic configuration
P	9	2,7
Q	17
R	10
S	12

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55. Complete the table given below and answer the following questions (symbol used are not true)

Write the chemical formula of the compound formed by combining S with P.

Element	Atomic number	Electronic configuration
P	9	2,7
Q	17
R	10
S	12

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56. Electronegativity values of some elements are given. Using these values, find whether the following compounds are ionic or covalent.

(Electronegativity _____ of

$Ca = 1, O = 3.5, C = 2.5, S = 2.58, H = 2.2, F = 3.98$

)

Sulphur dioxide (SO_2).

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57. Electronegativity values of some elements are given. Using these values, find whether the following

compounds are ionic or covalent.

(Electronegativity of

$Ca = 1, O = 3.5, C = 2.5, S = 2.58, H = 2.2, F = 3.98$

)

Water (H_2O)



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58. Electronegativity values of some elements are given. Using these values, find whether the following compounds are ionic or covalent.

(Electronegativity of

$Ca = 1, O = 3.5, C = 2.5, S = 2.58, H = 2.2, F = 3.98$

)

Calcium flouride (CaF_2),

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59. Some elements and their valencies are given

Write the chemical formula of barium chloride

Element	Valency
Ba	2
Cl	1
Zn	2
O	2

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60. Some elements and their valencies are given

Write the chemical formula of zinc oxide

Element	Valency
Ba	2
Cl	1
Zn	2
O	2



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61. Some elements and their valencies are given

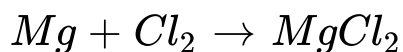
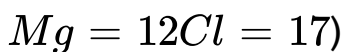
The chemical formula of calcium oxide is CaO . What is

the valency of calcium?

Element	Valency
Ba	2
Cl	1
Zn	2
O	2

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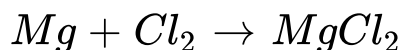
62. Examine the following chemical equations and answer the questions (Hint: Atomic Number



Complete the chemical equations.

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63. Examine the following chemical equations and answer the question. (Hint: Atomic Number

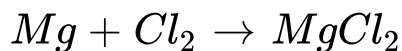
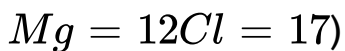


Which is the cation? Which is the anion?



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64. Examine the following chemical equations and answer the questions. (Hint: Atomic Number



Which type of chemical bond is present in $MgCl_2$?



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65. Electronegativity values of some elements are given. Using these values, find whether the following compounds are ionic or covalent.

(Electronegativity of

$Ca = 1, O = 3.5, C = 2.5, S = 2.58, H = 2.2, F = 3.98$

)

Carbon dioxide (CO_2)



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66. Draw the electron dot diagram of chemical bonds in methane (CH_4) and ethane(C_2H_6).

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67. P,Q,R,S are four elements. Their atomic numbers are 8,17,12 and 16 respectively. Find the type of chemical bond in these compounds formed by combining the following pairs of elements. Construct and exhibit the type of bonds using different substances (eg. pearls) (Electronegativity values: P=3.44,Q=3.16,R=1.31, S=2.5).

P,R

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68. P,Q,R,S are four elements. Their atomic numbers are 8,17,12 and 16 respectively. Find the type of chemical bond in these compounds formed by combining the following pairs of elements. Construct and exhibit the type of bonds using different substances (eg. pearls) (Electronegativity values: P=3.44,Q=3.16,R=1.31, S=2.5).

P,S



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69. P,Q,R,S are four elements. Their atomic numbers are 8,17,12 and 16 respectively. Find the type of chemical bond in these compounds formed by combining the

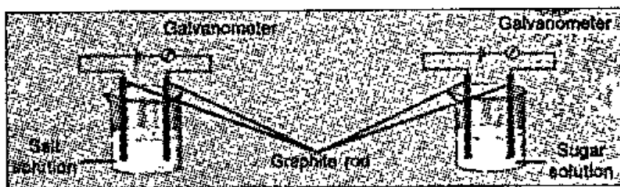
following pairs of elements. Construct and exhibit the type of bonds using different substances (eg. pearls) (Electronegativity values: $P=3.44, Q=3.16, R=1.31, S=2.5$)`.

Q,R

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70. Perform the experiment arranging the apparatus as shown in figure.

Record your observation and identify what type of compounds sodium chloride and sugar are



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