

Chemical Bonding

① What is an Electrovalent / Ionic Bond / Compound?

- Ans: • A bond formed between metal and non-metal.
• A bond " " by transfer of e^- from valence shell of one atom to other.
• A compound formed as such is called ionic / Electrovalent Compound

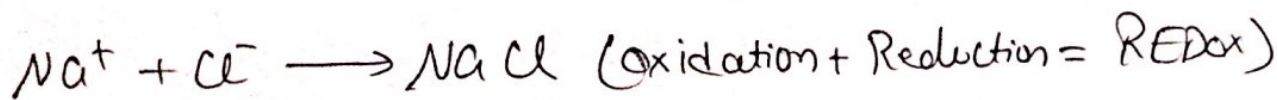
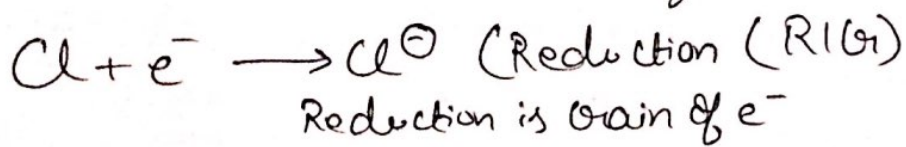
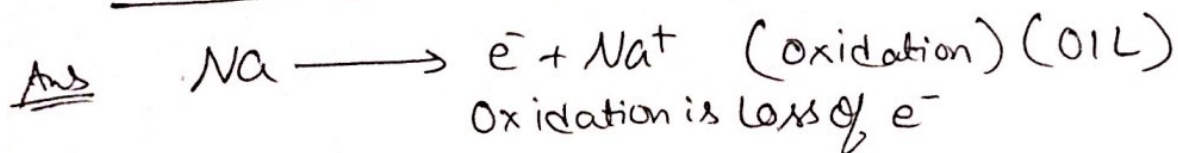
② An ionic Compound has :-

- Ans
- ions are bound together by strong electrostatic force
 - high Melting and Boiling point
 - solubility in water
 - conducts electricity in molten and aqueous state
 - exist as oppositely charged ions held together by strong electrostatic force of attraction
 - exist in solid state due to strong electrostatic force of attraction

③ Why NaCl conducts electricity in molten and aqueous state but not in solid state?

- Ans: In aqueous or molten state, ions are free to move but in solid state ions are held together by strong electrostatic force of attraction.

④ Electrovalent Compounds formation is an example of _____ (Reduction/Oxidation/Redox) Reaction.

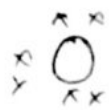


Ans Redox Reaction

Draw the e^- dot structure for
 i) MgO ii) AlCl₃

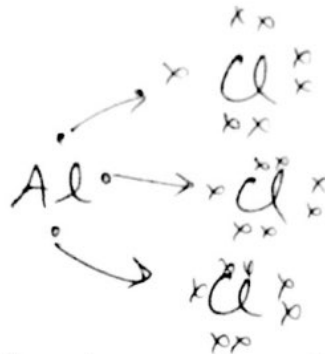
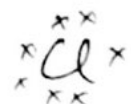
Ans: (i) Mg = 2, 8, 2 Mg:

O = 2, 6
 8



(ii) Al = 2, 8, 3 Al:

Cl = 2, 8, 7
 17



⑥ What are Covalent Compounds / Covalent Bond?

Ans: A bond formed between a non-metal and a non-metal is called Covalent Bond.

- A bond formed by mutual sharing of e^- between two non-metals.
- An element having 4, 5, 6, 7 combines with another element having 4, 5, 6, 7 elements to form covalent bond.

⑦ What are the properties of a covalent compound?

- Ans:
- made up of molecules
 - low melting and boiling point
 - held together by weak van-der-Waals force
 - Exist generally in gaseous or liquid state
 - Do not conduct electricity
 - Insoluble in water
 - Soluble in organic solvents.

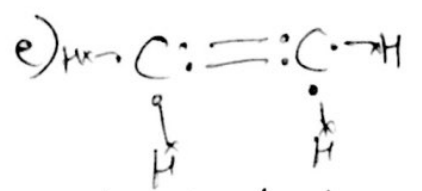
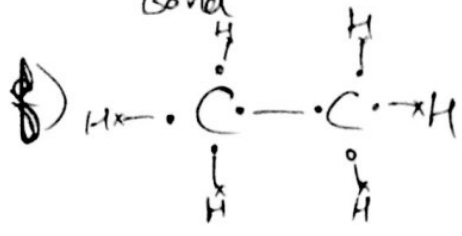
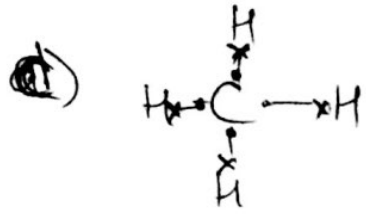
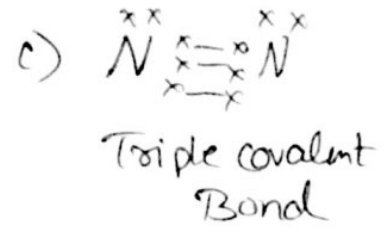
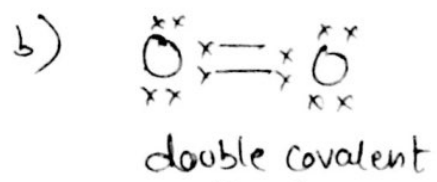
⑧ Ionic Compounds are formed by -

Ans Cations and Anions

Draw the e dot structure of

- a) H_2 b) O_2 c) N_2 d) CH_4 e) C_2H_4 f) C_2H_6
 g) CCl_4

Ans a) $H \times \times H$



10) What is the diff between Polar and non polar covalent Compounds?

Polar Covalent

- i) Between two non metals having E.N. difference
 Electronegativity
- ii) example $HCl, CHCl_3, HBr, HF, etc$
- iii) Conducts electricity in aqueous solution
- iv) Soluble in polar solvents (water)
- v) Electrolyte 2
 Contains molecules and ions as well

Non-Polar Covalent

- i) Between two non-metals having very small E.N. difference
- ii) $CCl_4, CH_4, H_2, Cl_2, Br_2,$
- iii) Do not conduct electricity
- iv) Soluble in non-polar solvents (CCl_4, C_6H_6 (Benzene))
- v) Non electrolyte as it contains molecules only

11) Compare NaCl and CCl_4 with respect to solubility in water and electrical conductivity

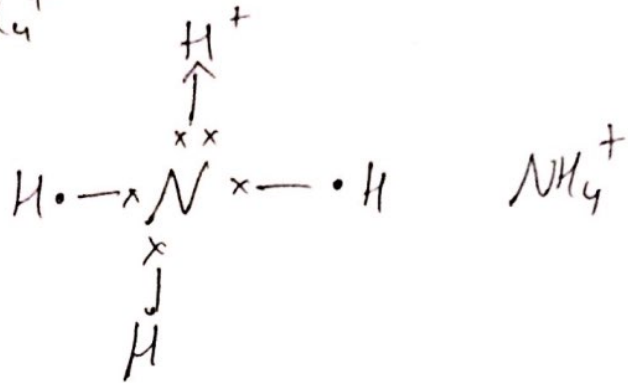
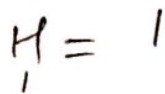
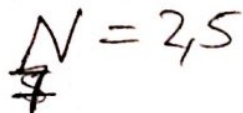
| | |
|---------------------|---------------------------|
| <u>NaCl</u> | <u>CCl_4</u> |
| i) Soluble in water | i) insoluble in water |
| ii) Conducts | ii) Do not conduct |

What is a Co-ordinate Bond?

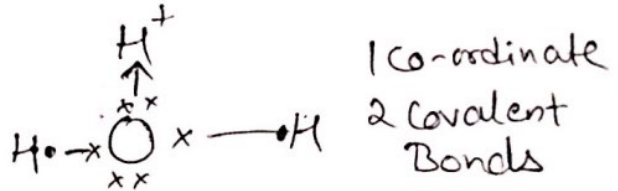
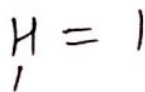
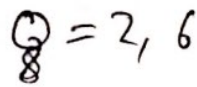
Ans: A Bond formed by sharing of e^- where both the e^- of shared pair are given by one atom only (donor) and accepted by another atom (acceptor)

(13) Draw the structure of i) Ammonium ion ii) Hydronium ion

Ans i) Ammonium ion NH_4^+

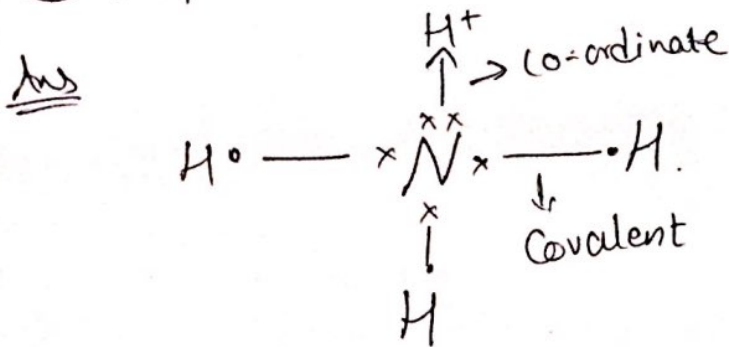


ii) Hydronium ion H_3O^+



1 Co-ordinate
2 Covalent
Bonds

(14) NH_4^+ contains _____ and _____ Bonds.

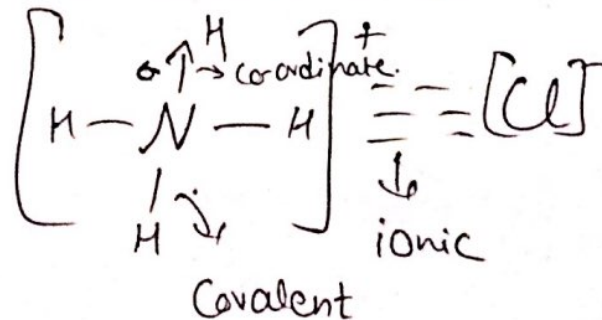


Co-ordinate and Covalent
Bond

1 Co-ordinate & 3 Covalent
Bonds

(15) Name Compound which contains ionic, covalent and co-ordinate bond.

Ans: NH_4Cl

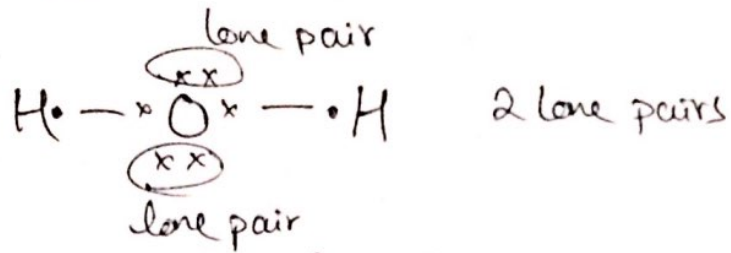


Covalent

what are lone pair of e⁻?

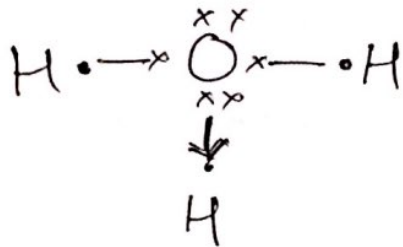
Ans A pair of e⁻ which do not participate in bond formation are called lone pair

example water: H₂O



(17) Draw the structure of an ion formed when an acid is dissolved in water.

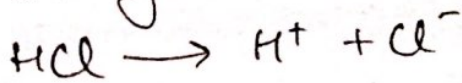
Ans structure of Hydronium ion H₃O⁺



(18) Differentiate between dissociation and ionisation.

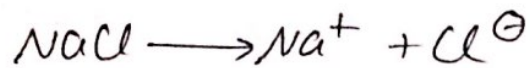
Ans: Ionisation

i) Polar Covalent Compounds undergo Ionisation



Dissociation

ii) Ionic Compound undergo dissociation



(19) Draw structure of CCl₄. State type of bond.

Ans
 C = 2, 4
 Cl = 2, 8, 7

