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CHEMISTRY IX NOTES CHEMICAL BONDING – THEORY & QUESTION ANSWERS

### 5.6 CO-ORDINATE COVALENT BOND

Q.10: What is co-ordinate covalent bond? Explain with examples.

Ans: **CO-ORDINATE COVALENT BOND OR DATIVE COVALENT BOND:**  
Co-ordinate Covalent Bond is the type of covalent bond in which both electrons forming a bond are supplied by one atom only. An arrow (→) is used to denote the bond, in which head of an arrow points towards acceptor atom. This type of bond is also called dative covalent bond.

**Donor:**  
The atom or molecule which supplies the pair of electrons for bond formation is known as "Donor".

**Acceptor:**  
The atom or molecule which accepts the electrons is known as "Acceptor".

**Lone Pair:**  
The pair of electrons possessed by donor is called "Lone Pair" of electrons.

**EXAMPLES OF CO-ORDINATE COVALENT BOND:**  
**Formation Of Ammonium Ion:**  
Ammonium chloride (NH<sub>4</sub>Cl) is formed by the combination of ammonia (NH<sub>3</sub>) and hydrogen chloride (HCl) molecule. In this formation nitrogen (N) atom of ammonia (NH<sub>3</sub>) acts as donor of an electron pair and hydrogen (H<sup>+</sup>) of hydrogen chloride (HCl) accepts it to form NH<sub>4</sub><sup>+</sup>Cl<sup>-</sup>.

**Representation:**  
An arrow is commonly used to denote the bond, in which the head of an arrow points towards the acceptor atom. (→)

**Donor Acceptor co-ordinate Covalent bond**

$$\begin{array}{c} \text{H} \\ | \\ \text{H}:\text{N}:\text{H} \\ | \\ \text{H} \end{array} + \text{H}:\text{Cl}: \longrightarrow \left[ \begin{array}{c} \text{H} \\ | \\ \text{H}:\text{N}:\text{H} \\ | \\ \text{H} \end{array} \right]^+ + \left[ \text{Cl} \right]^-$$

**Formation Of Hydronium Ion:**  
In the formation of hydronium ion (H<sub>3</sub>O<sup>+</sup>) from water molecule and hydrogen ion (H<sup>+</sup>), the oxygen atom of water acts as donor and hydrogen ion (H<sup>+</sup>) acts as acceptor.

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