

Co-ordinate Bond



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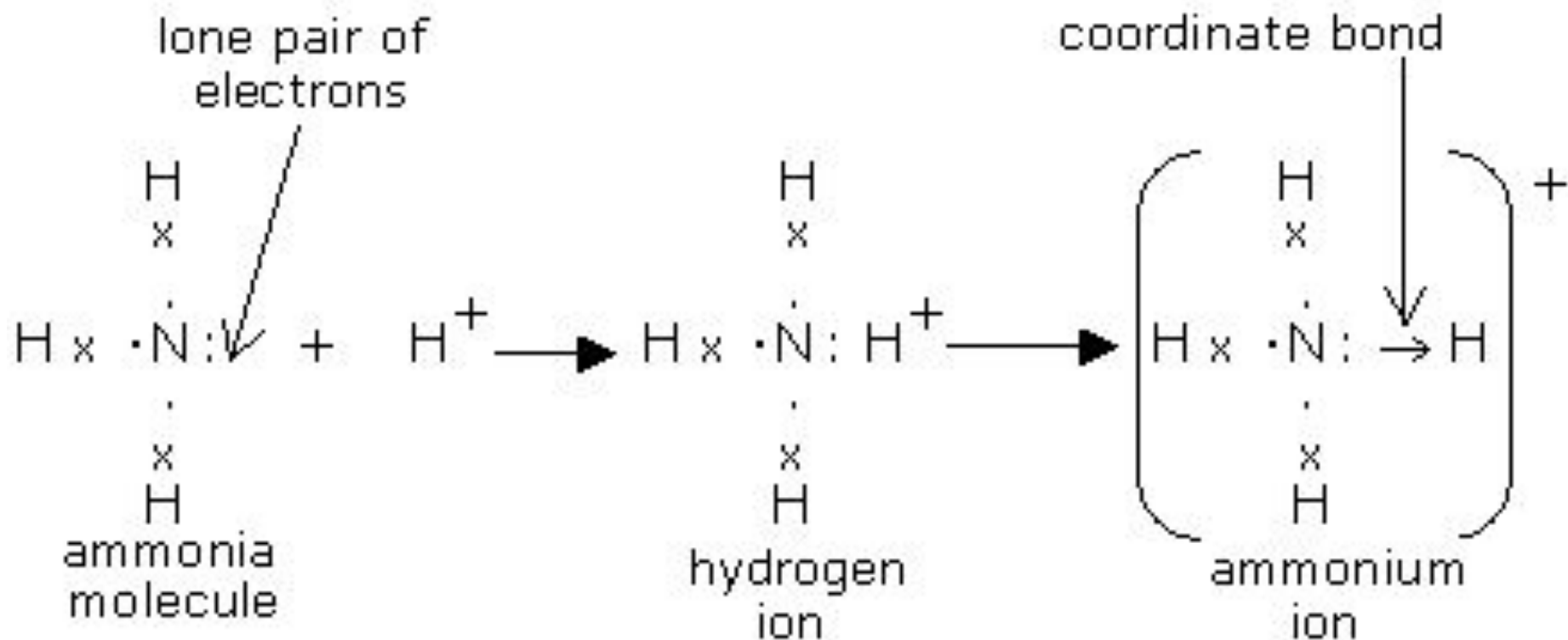
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Definition of Coordinate bond

The bond formed between two atoms by **sharing pair of electrons, provided entirely by one of the combining atoms but shared by both** is called co-ordinate bond or dative bond

Eg: ammonium ion (NH_4^+) and hydronium ion (H_3O^+)

Formation Of Coordinate Bond In Ammonium Ion

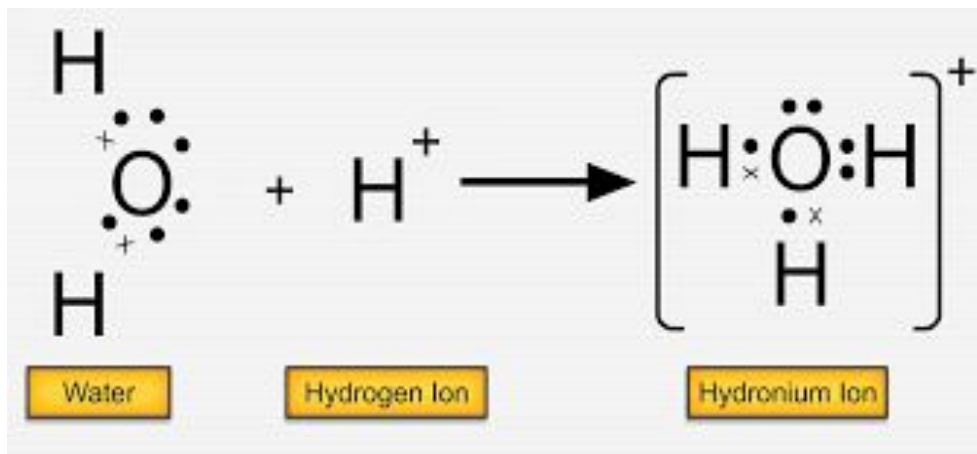


Explanation of bonding in Ammonium ion

- Nitrogen has 5 electron in valence shell ,in order to attain octet state it needs 3 more electron .it shares its 3 electron with 3 Hydrogen atom,so now each hydrogen atom has 2 electron and attains duplet state and Nitrogen atom has 8 electron.
- There are two types of electron with nitrogen 1)**Bonding pair** which are **involved in bonding** with hydrogen 2) **Lone pair** of electron which is **not bonded** with any other atom
- So we have a species with one lone pair of electron (**NH3**)and we need a **species which needs a lone pair of electron** like **H⁺**
- So now **NH3 provide its lone pair** of electron to H⁺ so that he gets its duplet structure hence represented by \longrightarrow

- The atom which provides the electron pair is known as **DONOR** and atom or ion sharing the donated electron pair is known as **ACCEPTOR**
- Donor atom is N and acceptor atom is H^+
- Another example will be H_3O^+

Coordinate Bonding in Hydronium ion



Properties of Coordinate compound

- 1)The Bond Is Directional
- 2)They are generally insoluble in water and soluble in organic solvents
- 3)They have high boiling and melting points, but lower than ionic compounds
- 4)These compounds are bad conductors of electricity.

Questions

1. During formation of ammonium ion, number of electrons shared between nitrogen atom and hydrogen ion is _____
2. _____ is an example of co-ordinate bond .
3. The pair of outer shell electrons not used in bonding are called as _____
4. The pair of electrons used in bonding are called as _____
5. Coordinate bond is represented as _____
6. In Ammonium ion _____ provides _____ electron and it is shared by _____
7. Difference between covalent and coordinate bond
8. Donor atom in Ammonium ion is _____
9. Acceptor atom in Ammonium ion is _____