

Why do atoms form chemical bonds? Explain any three types of bonds?

Why do atoms form bonds?

Atoms form chemical bonds with each other in order to gain stability. Atoms having incomplete valence electrons make bonds with other atoms to complete their valence shells either through complete transfer of electrons or mutual sharing of electron in ~~a~~ or any other ways. Neon gases have no need to form bonds with other atoms because their valence shells are complete. All the other atoms also want to attain like neon gas like electronic configuration to gain stability.

Types of Chemical Bonds

Ionic Bond:-

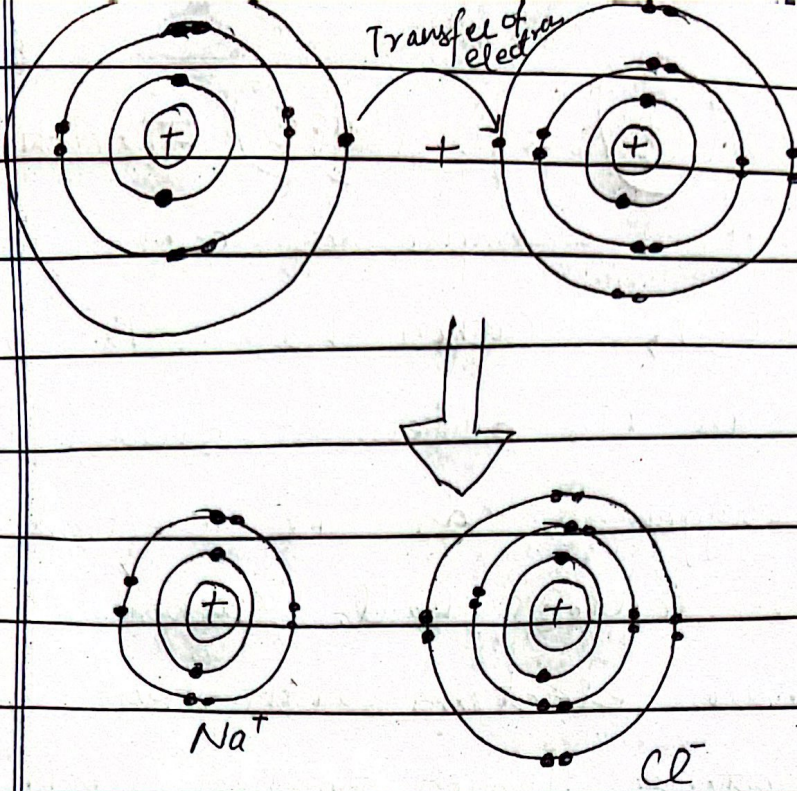
Ionic bond is a type of bond which is formed by the complete transfer of valence electrons from one atom to another.

Example:-

→ Electrostatic force of attraction between oppositely charged ions results in the formation of ionic bond. Compounds which take part in ionic bond formation are called ionic compounds.

Example:-

Consider the example of Na^+ (sodium ion) and Cl^- (Chlorine ion). Na^+ has one electron in outermost shell while chlorine has seven electrons in outermost shell. Both are unstable and trying to attain stability.



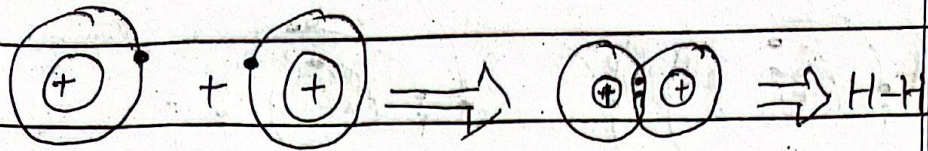
Covalent Bonds

Covalent bond is a type of bond which is formed by the mutual sharing of one or more pair of electrons.

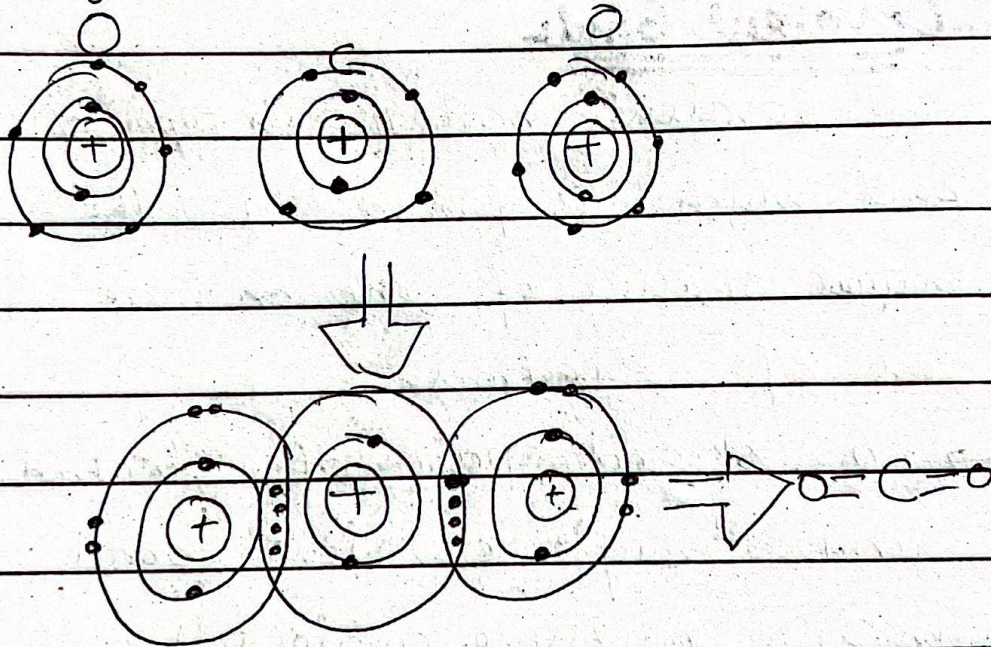
→ A shared pair of electron forms single covalent bond while multiple covalent bonds also exists.

Example:-

Consider a hydrogen molecule (H₂) which is formed by sharing of electron between the two atoms of hydrogen.



Consider the example of carbon dioxide (CO_2), carbon has 4 electrons in its outermost shell, and oxygen has six electrons in its outer shell. Carbon will share electrons with two oxygen atoms through double bonding.



Coordinate covalent Bond:-

Coordinate covalent bond is formed by sharing of a pair of electron by one atom to another atom which share no atom.

→ One atom has a lone pair of electrons while other atom has vacant outer shell.

→ One which share the lone pair of electron is called donor atom while which accept a pair of electron is called acceptor atom.

Example:-

Consider an example of ammonia. Nitrogen has a lone pair of electron which it shares to the hydrogen atom.

