There are two types of atomic bonds - ionic bonds and covalent bonds. They differ in their structure and properties. Covalent bonds consist of pairs of electrons shared by two atoms, and bind the atoms in a fixed orientation. Relatively high energies are required to break them (50 - 200 kcal/mol). Whether two atoms can form a covalent bond depends upon their electronegativity i.e. the power of an atom in a molecule to attract electrons to itself. If two atoms differ considerably in their electronegativity - as sodium and chloride do - then one of the atoms will lose its electron to the other atom. This results in a positively charged ion (cation) and negatively charged ion (anion). The bond between these two ions is called an ionic bond.

### Covalent Bonds

- **State at room temperature:** Liquid or gaseous
- **Polarity:** Low
- **Formation:** A covalent bond is formed between two non-metals that have similar electronegativities. Neither atom is "strong" enough to attract electrons from the other. For stabilization, they share their electrons from outer molecular orbit with others.
- **Shape:** Definite shape
- **Melting point:** low
- **What is it?:** Covalent bonding is a form of chemical bonding between two non-metallic atoms which is characterized by the sharing of pairs of electrons between atoms and other covalent bonds.
- **Boiling point:** Low
- **Examples:** Methane (CH₄), Hydrochloric acid (HCl)
- **Occurs between:** Two non-metals

### Ionic Bonds

- **State at room temperature:** Solid
- **Polarity:** High
- **Formation:** An ionic bond is formed between a metal and a non-metal. Non-metals(-ve ion) are "stronger" than the metal(+ve ion) and can get electrons very easily from the metal. These two opposite ions attract each other and form the ionic bond.
- **Shape:** No definite shape
- **Melting point:** High
- **What is it?:** Ionic bond, also known as electrovalent bond, is a type of bond formed from the electrostatic attraction between oppositely charged ions in a chemical compound. These kinds of bonds occur mainly between a metallic and a non metallic atom.
- **Boiling point:** High
- **Examples:** Sodium chloride (NaCl), Sulfuric Acid (H₂SO₄)
- **Occurs between:** One metal and one non-metal

**Contributors**

- Content originates from [http://www.diffen.com](http://www.diffen.com)