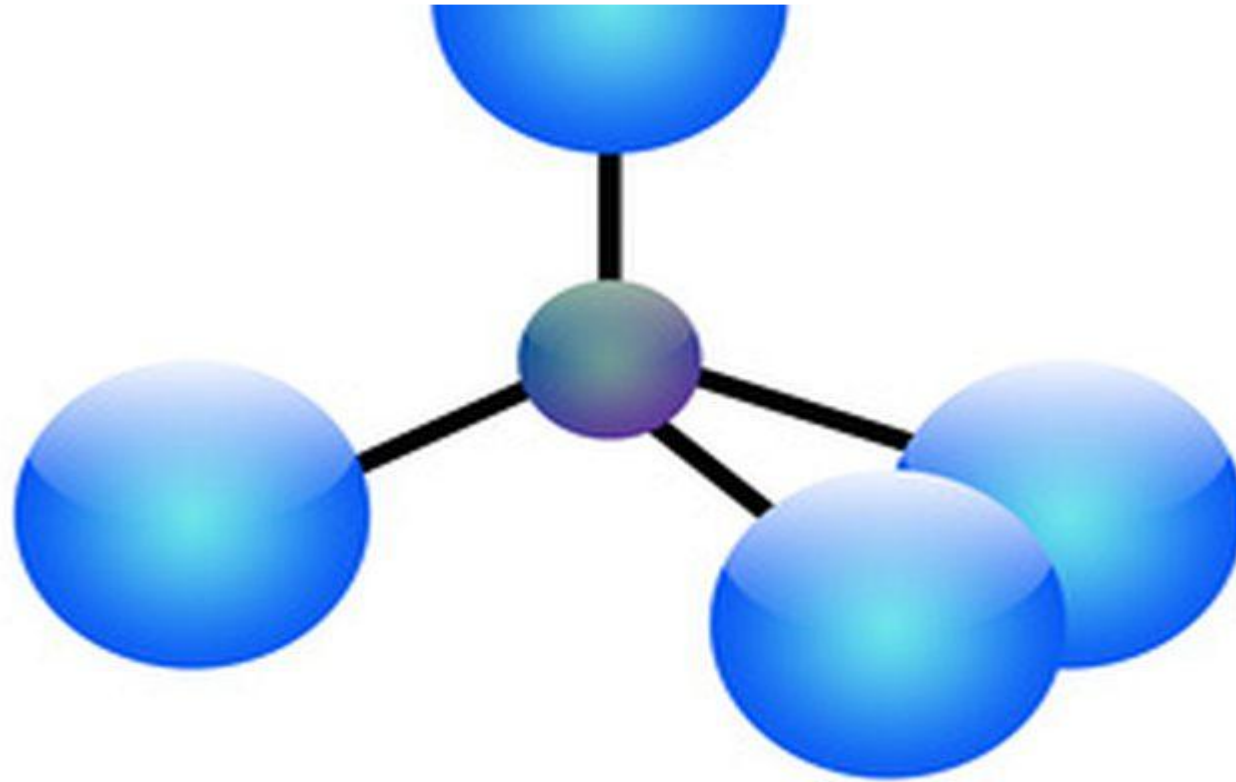


Types of chemical bonds in crystals

Atoms bond during chemical reactions to result in crystal formation. Crystals are defined as a solid state of matter in which atoms are packed together tightly. The distinguishing feature of crystals is that their solid form is symmetrical on all sides. The specific geometrical shape of crystals is called a crystal lattice. When the electrons of atoms combine with surrounding atoms, a chemical bond is consummated, and crystals are formed.



Types of chemical bonds in crystals

1. IONIC BONDS

2. COVALENT BONDS

3. VAN DER WAALS BONDS

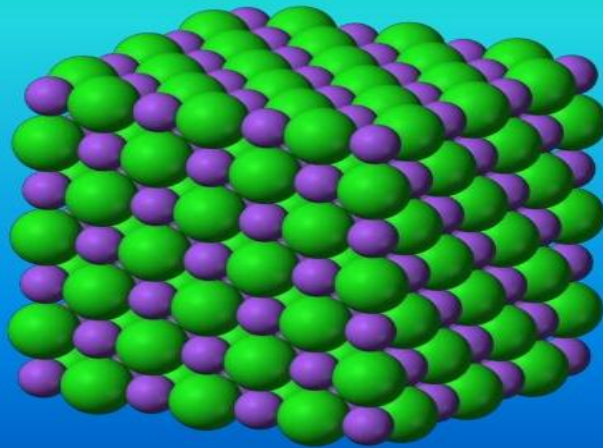
4. HYDROGEN BONDS

5. METALLIC BONDS

IONIC BONDS

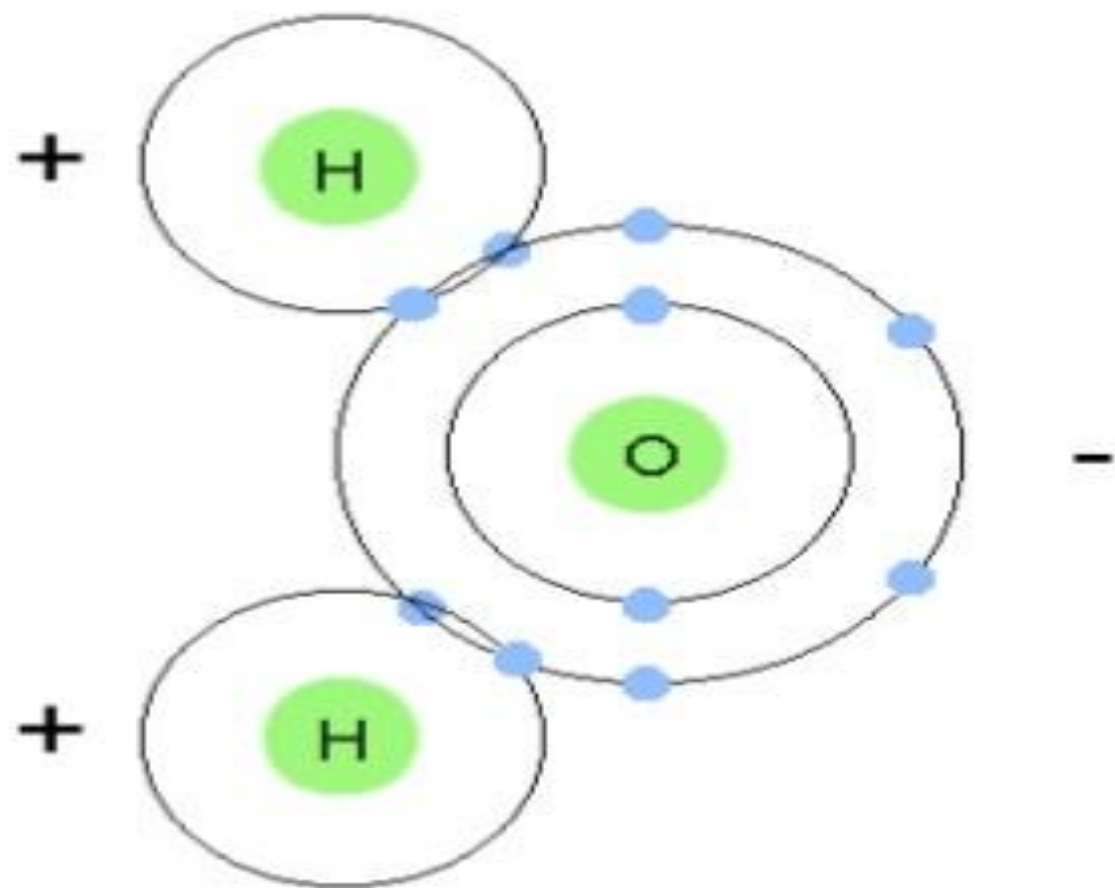
When ionic crystals are formed, electrons jump their orbits to bond with the corresponding supporting atom. The resultant combination of negatively or positively charged electrostatic forces stabilizes ions. The physicist Charles Augustin de Coulomb defined these electrostatic forces, or Coulombic forces, in the form of a law. According to Coulomb's law, the attractive forces formed between the atoms pull the atoms together, and this action is adversely replicated because of the similar charges between the same ions. This results in a very strong bond of atoms in the crystals. These highly intense forces attribute high melting points and rigid structures to these crystals.

Ionic Bonding



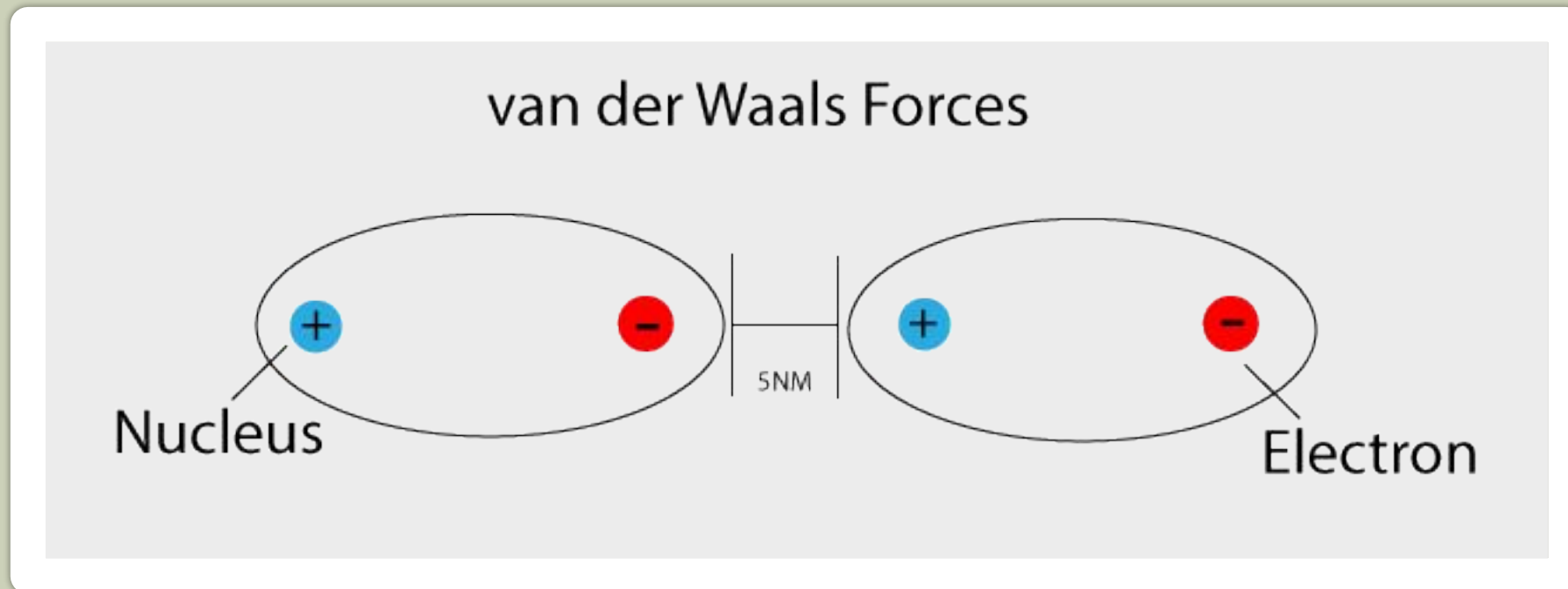
What is a Covalent Bond?

- Covalent Bond
 - A chemical bond that results from sharing valence electrons
- Molecule
 - When 2 or more atoms bond covalently
 - The shared electrons are part of the outer energy level
 - Generally form between non-metallic elements



VAN DER WAALS BONDS

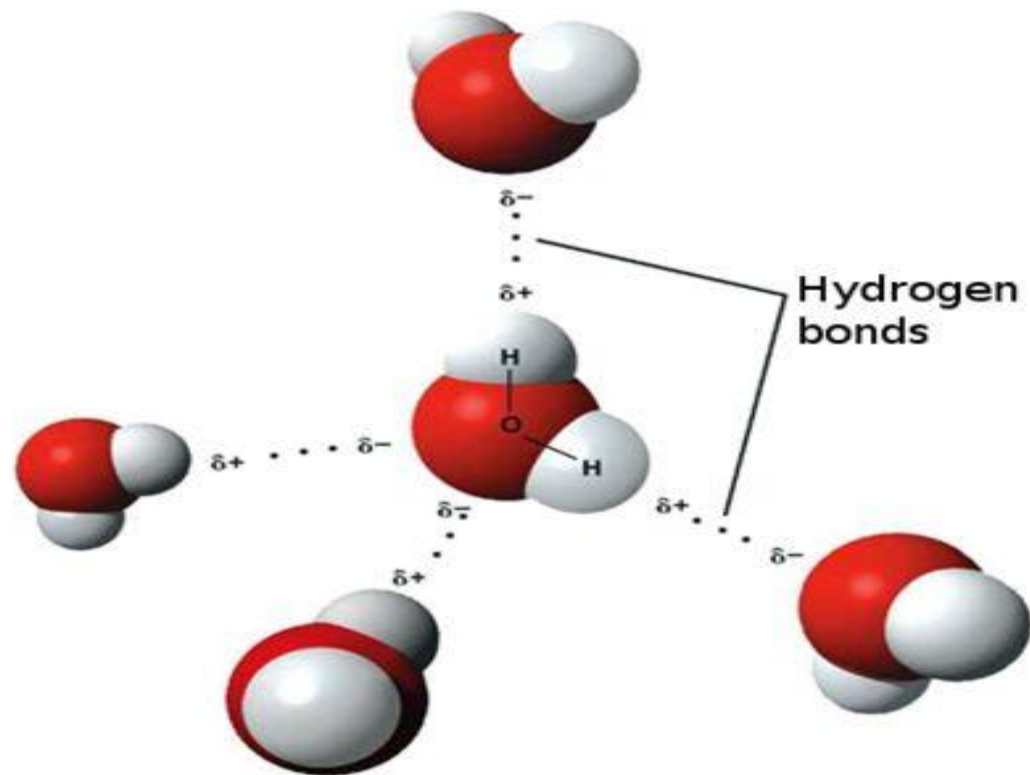
A Van der Waals bond is a weak interaction between the atoms of a substance, resulting in soft-consistency crystals. The outer orbit of the atoms is completely filled with shared electrons, but their charge keeps transferring.



Hydrogen Bonding

- A hydrogen bond is the force of attraction between a hydrogen molecule with a partial positive charge and another atom or molecule with a partial or full negative charge.
- The polar nature of water also causes water molecules to be attracted to one another.

- The positively charged region of one water molecule is attracted to the negatively charged region of another water molecule.

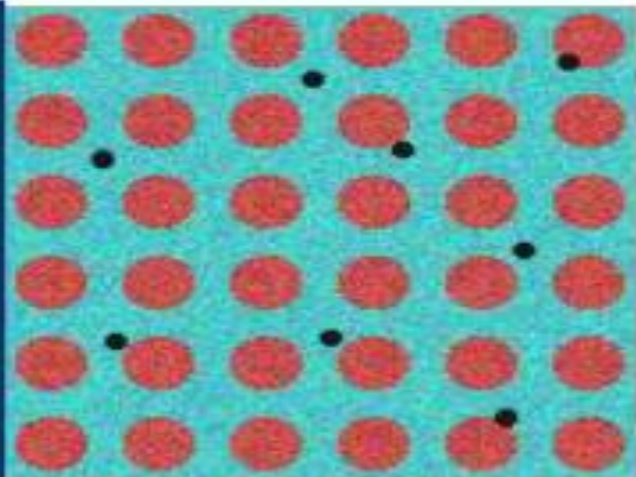


Metallic Bonding

What is a Metallic Bond?

- A metallic bond occurs in metals. A metal consists of positive ions surrounded by a “sea” of mobile electrons.

This shows what a metallic bond might look like.



Name 4 Characteristics of a Metallic Bond.

1. Good conductors of heat and electricity
2. Great strength
3. Malleable and Ductile
4. Luster

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