

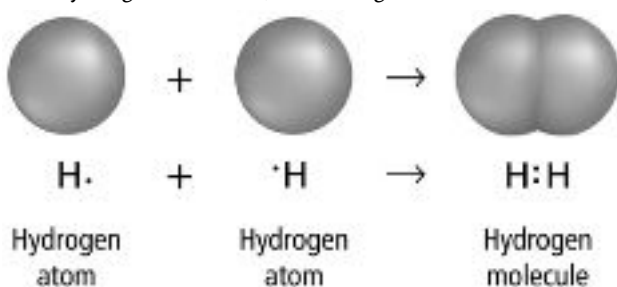
The most stable arrangement of atoms in a covalent bond exists at some optimal distance between nuclei. At this point, the net attraction is greater than the net repulsion.

Molecular Compounds

- the chemical formula of a molecular compound.
- shows how many atoms of each element a molecule contains.
- A **molecular formula** shows the actual number of atoms, while a formula unit (for ionic compounds) shows the lowest whole-number ratio of ions.

Single Covalent Bonds

- When only one pair of electrons is shared, such as in a hydrogen molecule, it is a single covalent bond.



- Sigma bonds** occur when the pair of shared electrons is in an area centered between the two atoms.

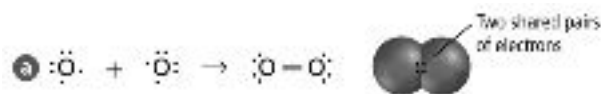


Multiple Covalent Compounds

- Sharing multiple pairs of electrons forms multiple covalent bonds

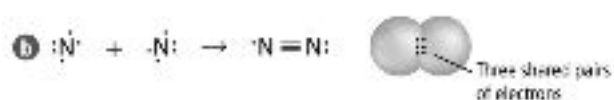
Double Bonds

- form when two pairs of electrons are shared between two atoms



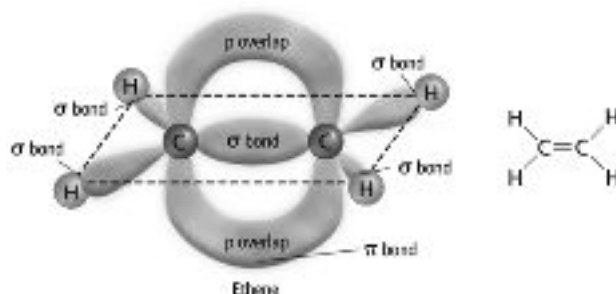
Triple Bonds

- form when three pairs of electrons are shared between two atoms



The Pi Bonds

- form when parallel orbitals overlap and share electrons.
- The shared electron pair of a pi bond occupies the space above and below the line that represents where the atoms are joined together



The Strength of Covalent Bonds

- The strength depends on the distance between the two nuclei, or bond length.
- As length increases, strength decreases.
- The amount of energy required to break a bond is called **the bond dissociation energy**.
- The shorter the bond length, the greater the energy required to break it.

Naming Binary Molecular Compounds

- The first element is always named first using the entire element name.
- The second element is named using its root and adding the suffix -ide.
- Prefixes are used to indicate the number of atoms of each element that are present in the compound.

Exceptions:

- The first element in the compound name **never** uses the *mono-* prefix
- If using a prefix results in two consecutive vowels, one of the vowels is usually dropped to avoid an awkward pronunciation

Naming Acids

- The first word has the prefix hydro- followed by the root of the element plus the suffix -ic.
- The second word is always acid (hydrochloric acid is HCl in water).

Oxyacid

- an acid that contains both a hydrogen atom and an oxyanion
- Naming Oxyacids**
 - Identify the oxyanion present.
 - The first word is the root of the oxyanion + the prefix per- or hypo- if it is part of the name + the suffix -ic if the anion ends in -ate or -ous if the oxyanion ends in -ite