

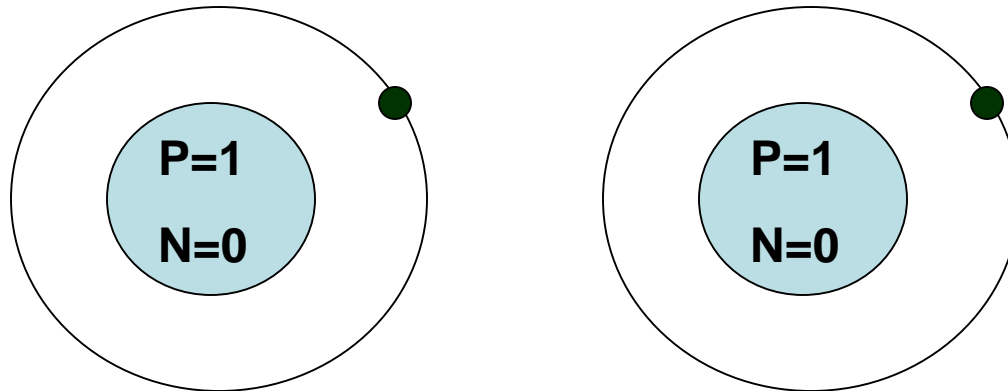
# **Covalent and Metallic Bonds**

## **Chapter 13.3**

# I. Covalent Bonds

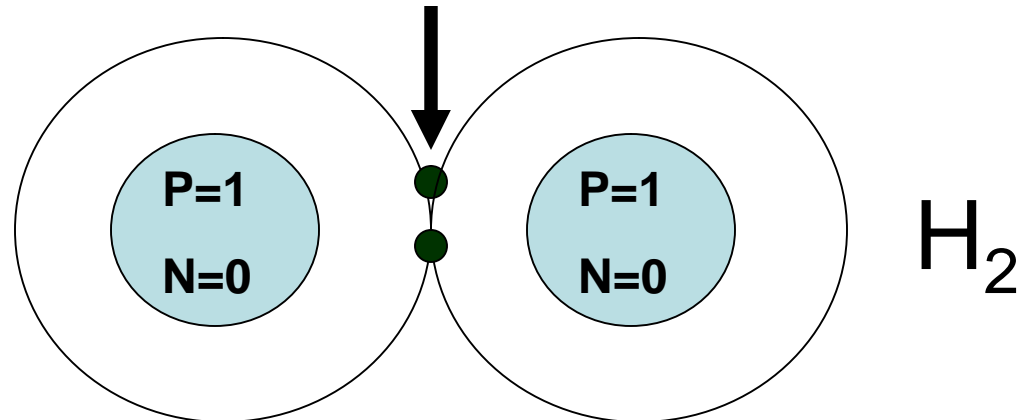
**Covalent Bond:** A bond where atoms share one or more pairs of electrons.

**Unstable**

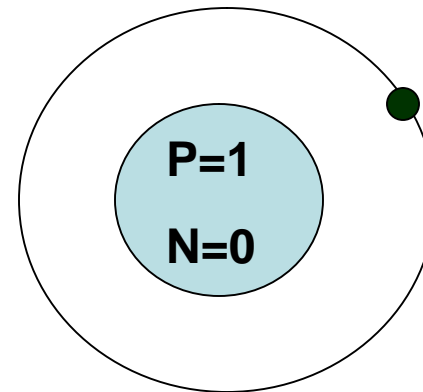
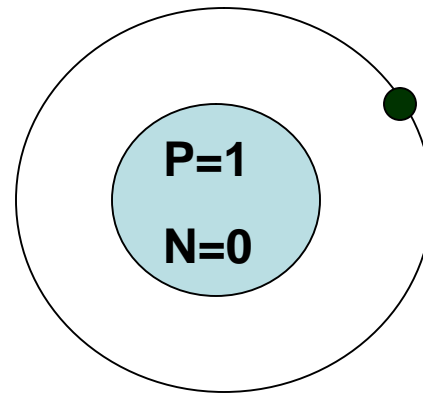
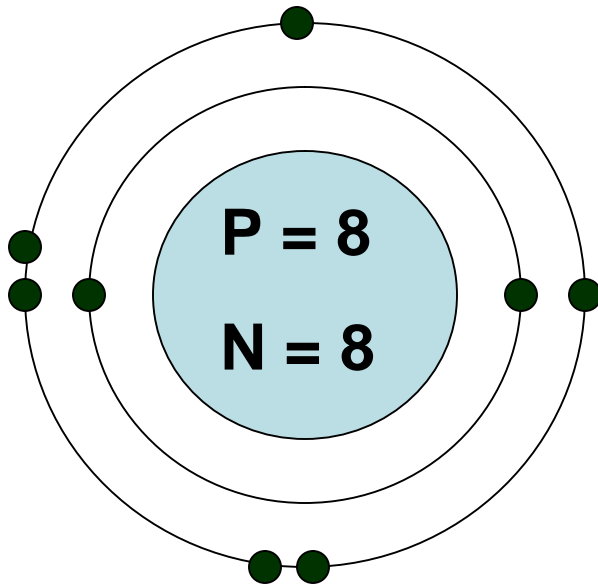


**Covalent Bond**

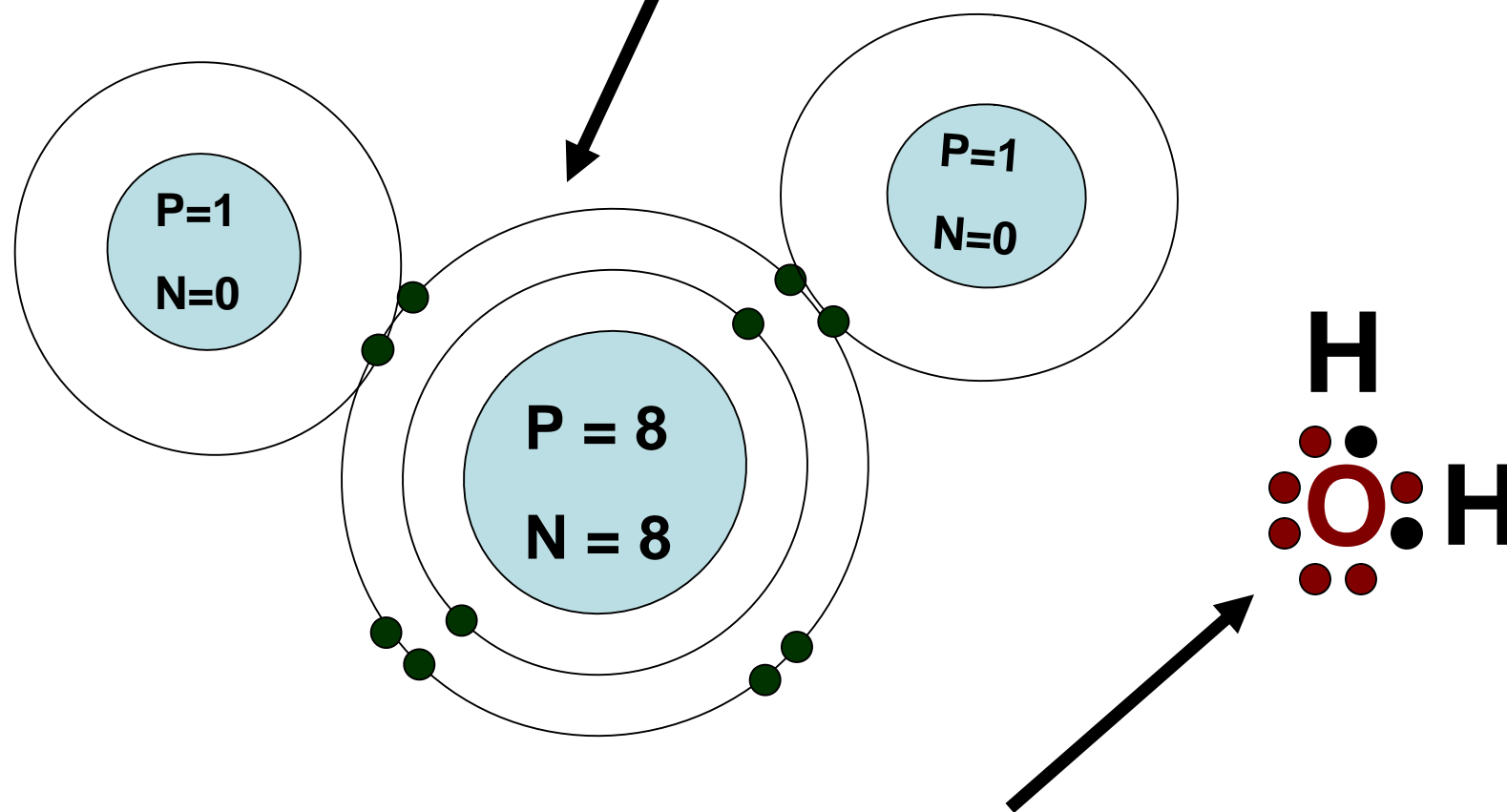
**Stable**



**TPS:** Draw a shield model for 1 oxygen and 2 hydrogen atoms



**TPS:** Draw a shield diagram for a water molecule ( $\text{H}_2\text{O}$ )



**TPS:** Draw an Electron-Dot (Lewis) Diagram for a water molecule ( $\text{H}_2\text{O}$ )

# A. Molecules

**Molecule:** a particle made of 2 or more atoms joined in a definite ratio.

## **B. Properties of Covalent Molecules**

- Low melting points
- Low boiling points
- Brittle in the solid state.

## C. Types of Covalent Molecules

**Diatomic molecules:** molecules made of 2 atoms.

Examples:

HF – hydrofluoric acid

CO – carbon monoxide

**Diatomic Element:** a diatomic molecule made of 2 of the same elements.

Examples:  $H_2$ ,  $O_2$ ,  $N_2$

## Larger Covalent Molecules

$\text{H}_2\text{O}$  – Water

$\text{C}_6\text{H}_{12}\text{O}_6$  – Glucose (sugar)

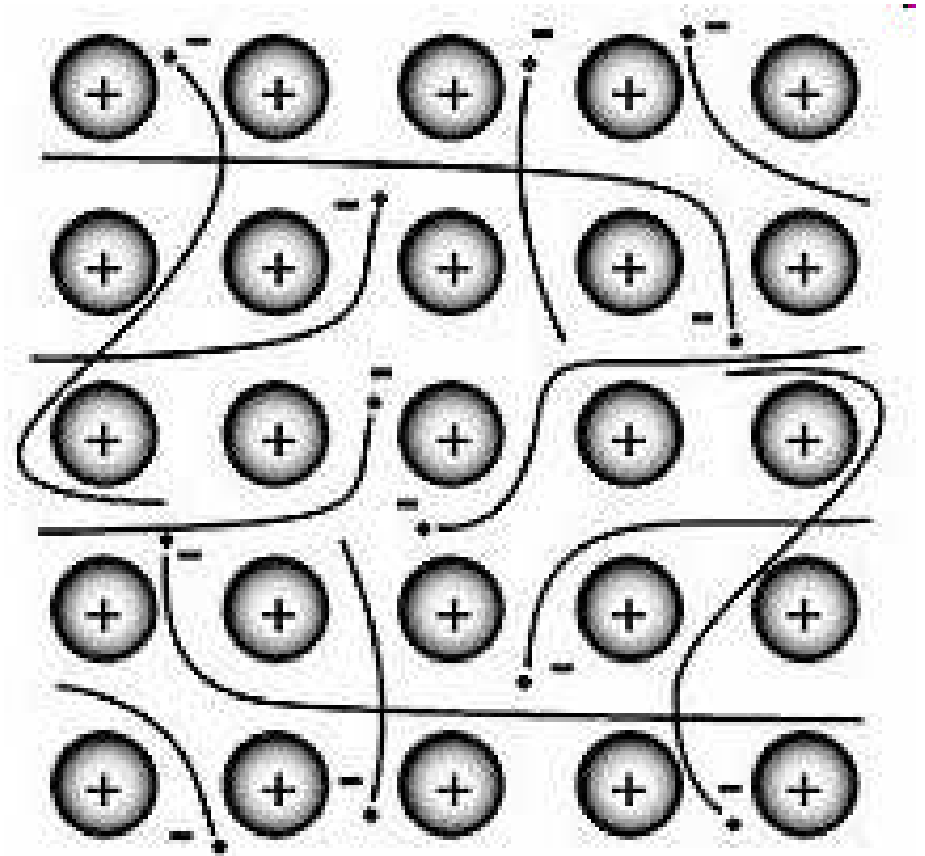
Proteins

DNA

## II. Metallic Bonds

**Metallic Bond:** A bond between positively charged metal atoms and their electrons.

These electrons flow freely throughout the metal.



# A. Properties of Metals

- Conduct heat and electricity very well.
- Malleable – bends without breaking.
- Ductile – can be stretched (gum)