

WATER: The Primary Molecule of Life

- ▶ it is the MOST abundant molecule in any cell

What makes it so important?

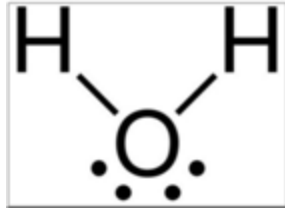


Its Functions

- ▶ Carrier for dissolved molecules in and out of cells
- ▶ Provides raw material (reactant) in many cell reactions
- ▶ Acts as lubricant between cells, tissues, and organs.
- ▶ Regulates temperature

Structure of Water

▶ H_2O



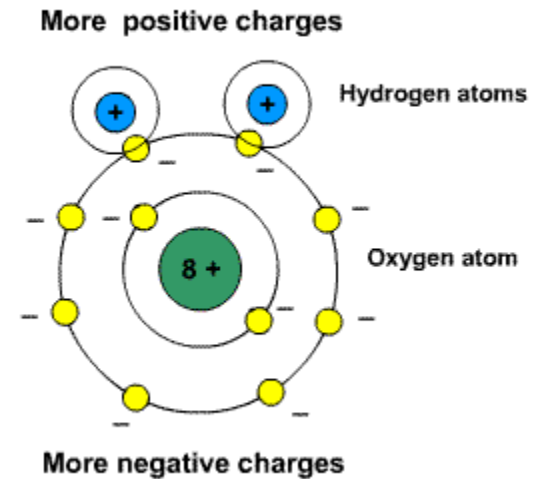
▶ Water is a **POLAR** molecule!

→ slightly negative charge at one end due to the oxygen

→ slightly positive charge at the other end due to the hydrogen

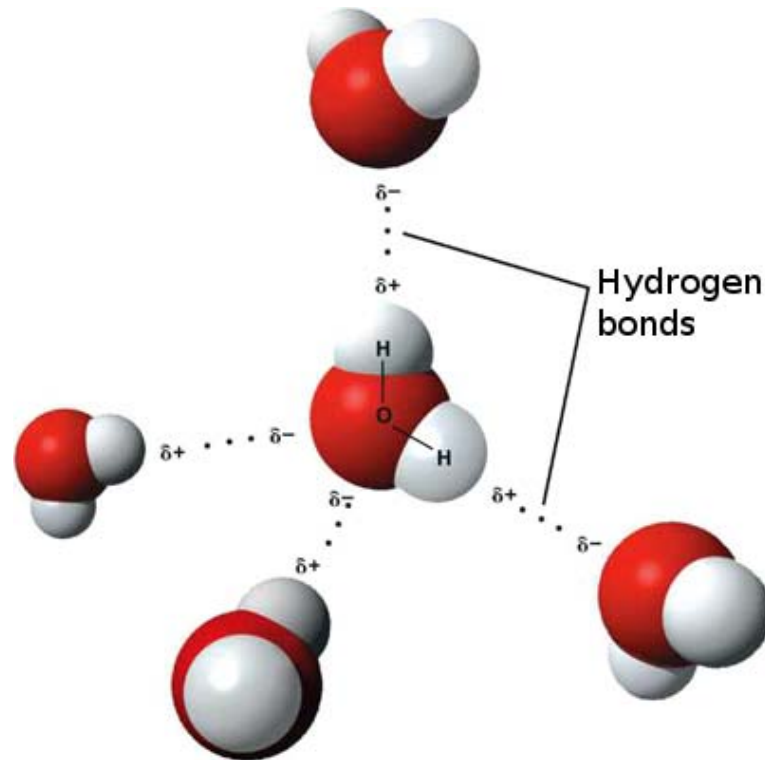
▶ Why is its structure significant?

→ it allows water molecules to attract to **EACH OTHER** and also to **OTHER POLAR** molecules.



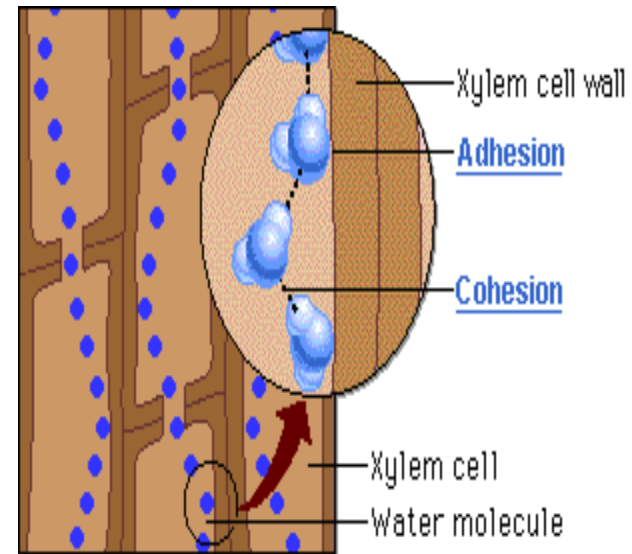
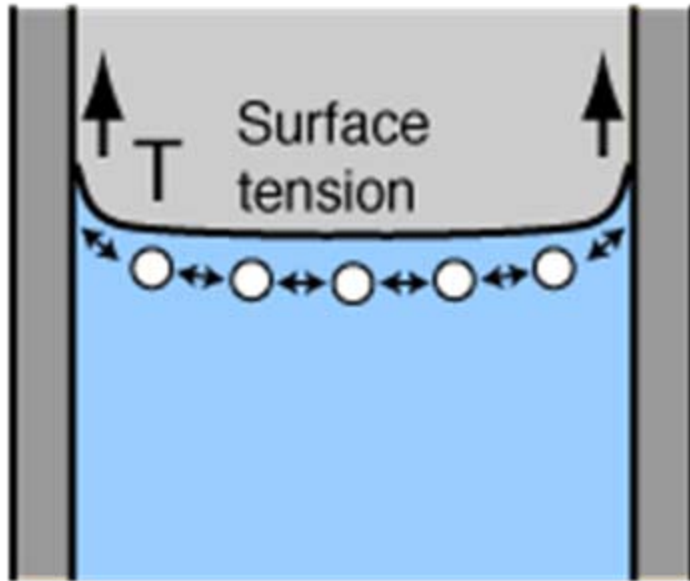
Cohesion: Water Attracts Water

- ▶ Water molecules can hydrogen bond with water molecules



Adhesion: Water Attracts Other Polar Substances

- ▶ Other Polar molecules can form hydrogen bonds with water molecules

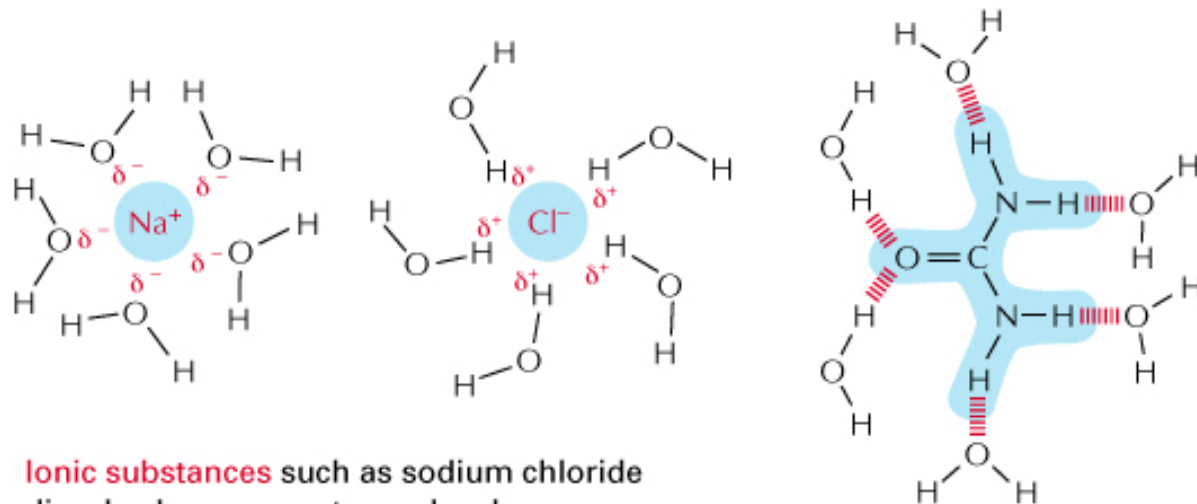


Adhesion:

Water Attracts Other Polar Substances

- ▶ Other Polar molecules can form hydrogen bonds with water molecules

Substances that dissolve readily in water are termed **hydrophilic**. They are composed of ions or polar molecules that attract water molecules through electrical charge effects. Water molecules surround each ion or polar molecule on the surface of a solid substance and carry it into solution.



Ionic substances such as sodium chloride dissolve because water molecules are attracted to the positive (Na^+) or negative (Cl^-) charge of each ion.

Polar substances such as urea dissolve because their molecules form hydrogen bonds with the surrounding water molecules