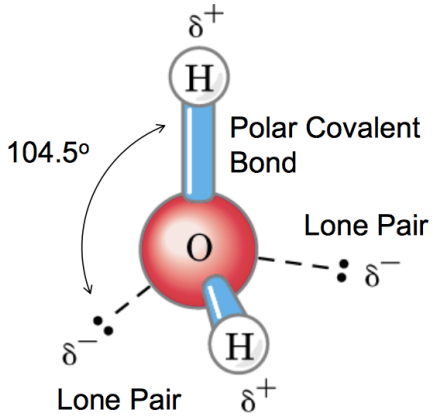
BMS1021 – CELLS, TISSUES & ORGANISMS

CHEMICAL PROPERTIES OF CELLS – H_2O

Polarity of water

- Water is a *polar* molecule
- 4 Hydrogen bonds form attractive forces between water molecules but are not as strong as covalent bonds
- Tetrahedral structure
- H bonds with F, O, N
- H bonds *take more energy* to get to b.p and m.p leading to *higher* m.p and b.p



Properties of water

Property	Description	Biological importance
Cohesion	Due to the strength of hydrogen bonding, water molecules are highly attracted to each other.	Capillary transport in plants, insects walking on water
High specific heat capacity	Due to hydrogen bonding, water requires a lot of energy to change the temperature of 1g of water by 1 degree.	Helps maintain constant body temperature, oceans absorb heat in the day and release heat during the night
Heat of vapourisation	It is the amount of heat absorbed to change from liquid to gas. Due to hydrogen bonding, a lot of energy is required to break the bond to convert to liquid. Excess energy can be used to cool us down (evaporation).	Helps keep our bodies cool via evaporation and sweating. Large amount of heat is used to break hydrogen bonds between water molecules.
Low density of ice	Ice hydrogen bonds are stable and in a fixed position, while in liquid form H bonds break and reform constantly.	Forms at the surface of ponds and lakes to allow life to continue underneath via insulation. Ice is less dense than water.
Water as a solvent	Water acts as the medium through which materials and molecules are transported.	Principle solvent for materials within cells. Good for absorption and transport. Can dissolve polar molecules.