

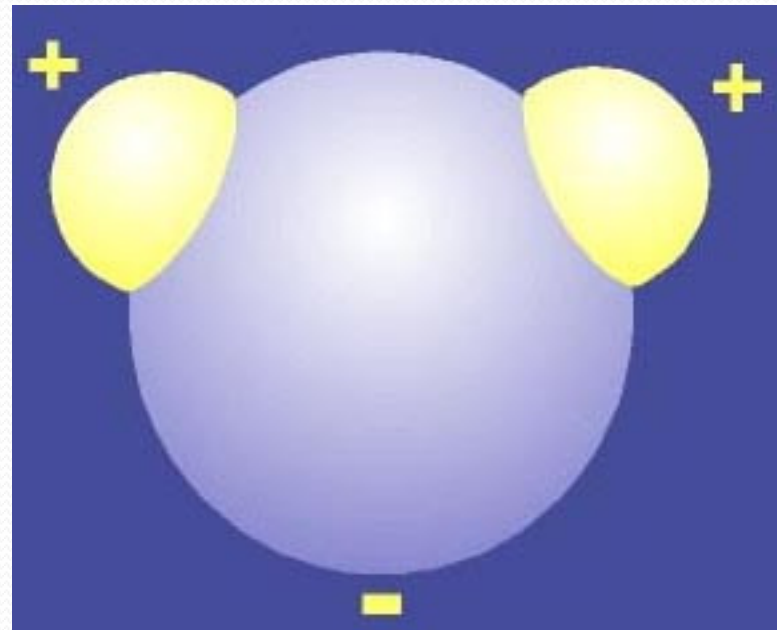


WATER

Characteristics and its role in biological systems

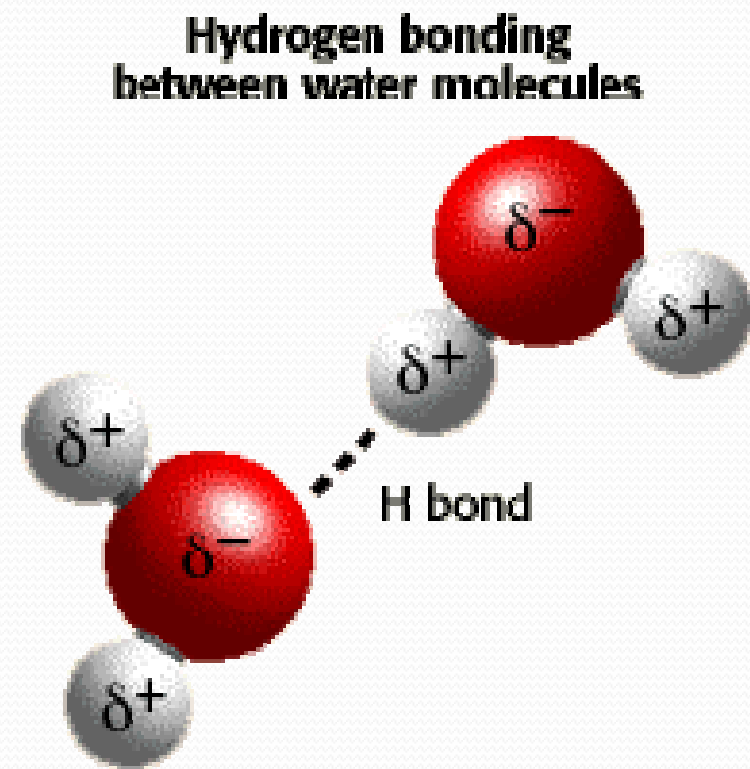
Water is a polar molecule

- H_2O is an inorganic molecule (no carbon)
- 'H' and 'O' are held together by covalent bonds (electron sharing)
- 'O' is bigger and has more pull on the shared electrons giving the 'O' end slightly '-' and the 'H' end slightly '+'



Water forms hydrogen bonds

- The slightly '+' H of one molecule is attracted to the slightly '-' O of another forming a H-bond
- H-bonds are weak and easily broken
- Colder water = stronger H-bonds, hotter = weaker
- H₂O is also able to dissociate (break apart) into H⁺ and OH⁻ ions



The Polarity of Water...

Gives it many characteristics that are beneficial to life.



UNIVERSAL SOLVENT

- Water is a good dissolving agent
- Due to its polarity, water molecules surround other molecules and separate them into ions – this allows reactions to occur
- This is particularly important in blood



TEMPERATURE REGULATOR

- Water has a high 'specific heat capacity' due to its formation of H-bonds
- It can absorb or release a large amount of energy before it changes temperature
- This explains the relatively consistent temperature of large bodies of water such as the oceans
- This is also important in helping to maintain consistent body temperature particularly in cold blooded animals

LUBRICANT

- Water acts as a lubricant for cell parts and body structures
- Examples include: tears in the eyes, saliva moistening food and lubricating the esophagus during swallowing

