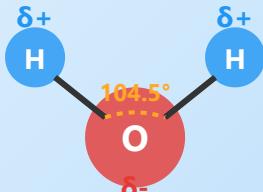


Water - The Solvent of Life

H₂O Molecular Structure



Unique Properties

- High heat capacity
- High heat of vaporization
- Less dense as solid (ice floats)
- Excellent solvent for polar molecules

Hydrophobic Effect

- Nonpolar molecules cluster together
- Drives protein folding
- Forms lipid bilayers
- Entropy-driven process

Molecular Structure

- Bent geometry (104.5°)
- Polar covalent O-H bonds
- Partial charges: $\delta-$ O, $\delta+$ H
- Strong dipole moment

Solvation

- Water molecules surround ions
- Hydration shells stabilize charges
- Affects biochemical reactions
- Critical for ion transport

H-Bond Network



Hydrogen Bond Network