EWCE 105
Environmental Chemistry

Lecture 3

Instructor

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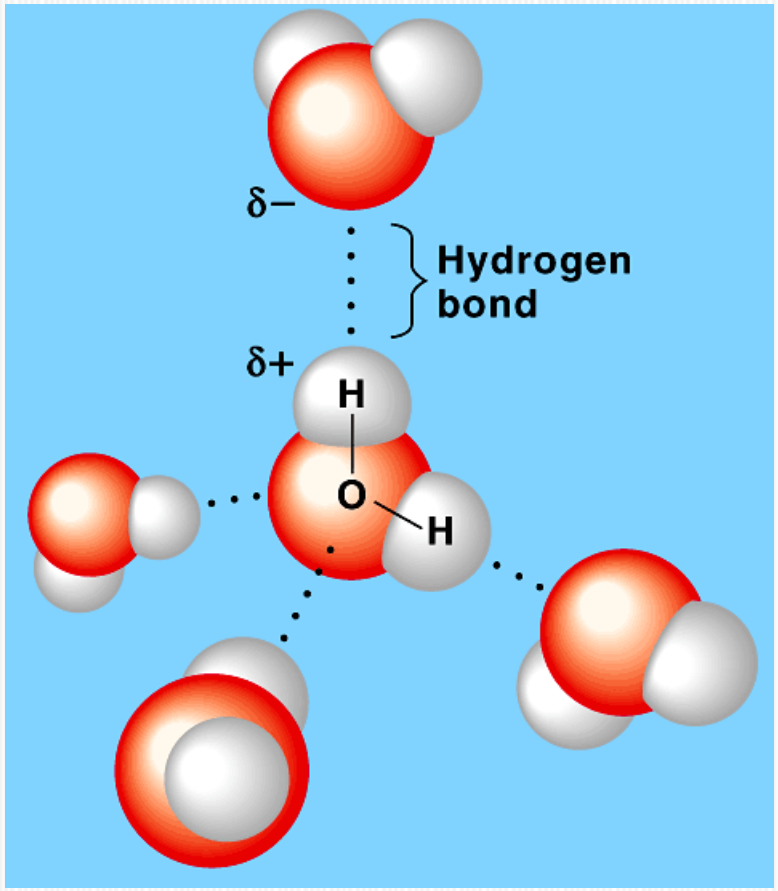
Department of EWCE, MIST

Lecture Details

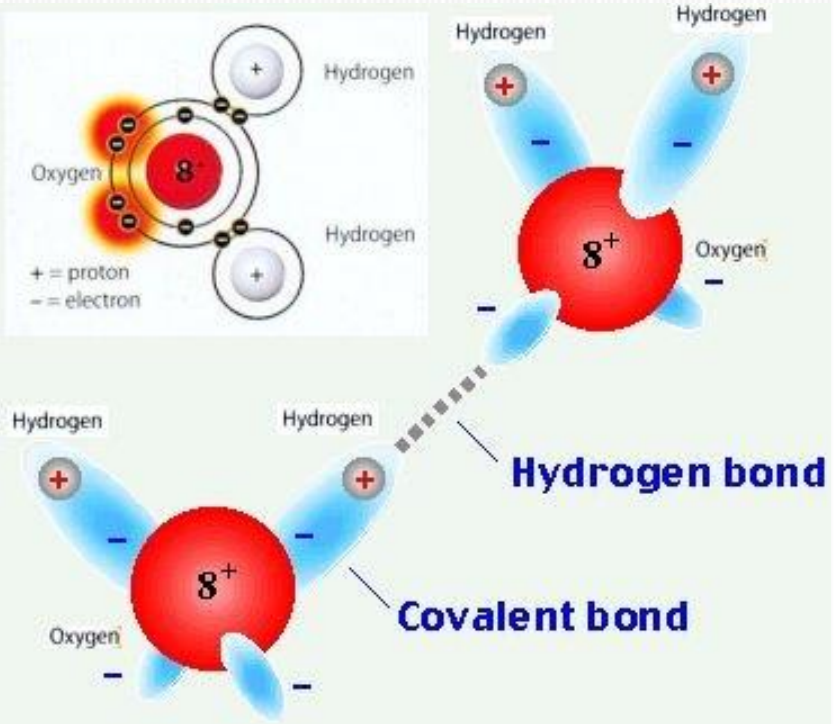
Topics	Reference
• Chemical properties of water • Major aquatic chemical process	Environmental Chemistry – Stanley E. Manahan 8th ed. CRC Press.

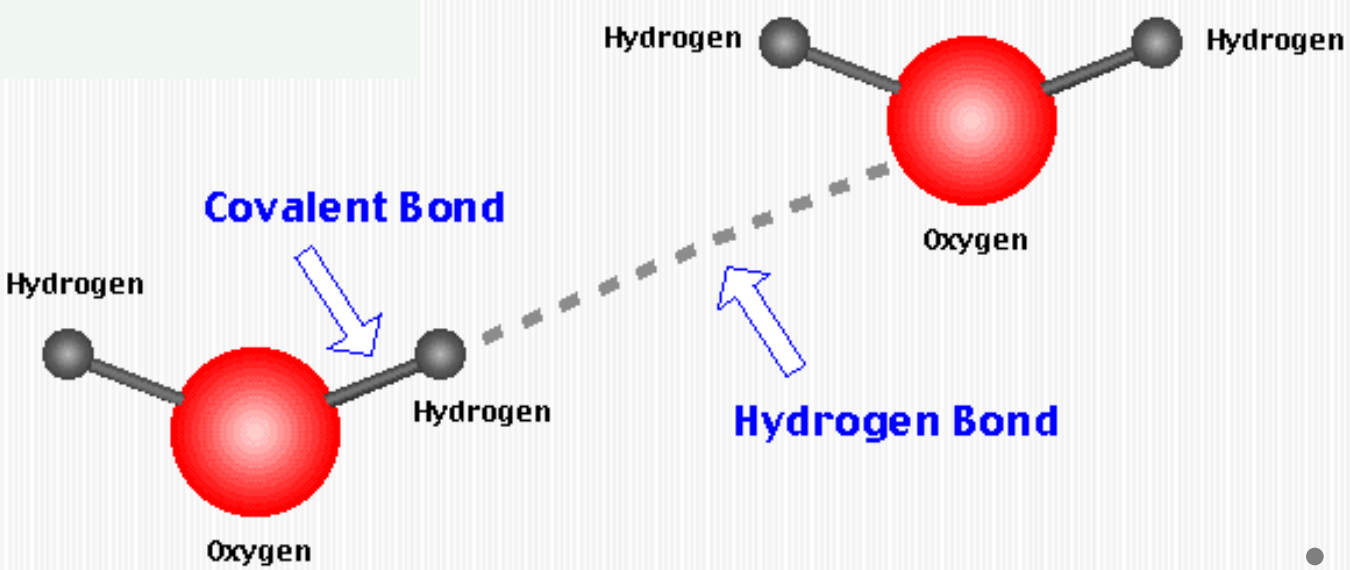
Hydrogen Bond

The attractive force between the hydrogen attached to an electronegative atom of one molecule and an electronegative atom of a different molecule.



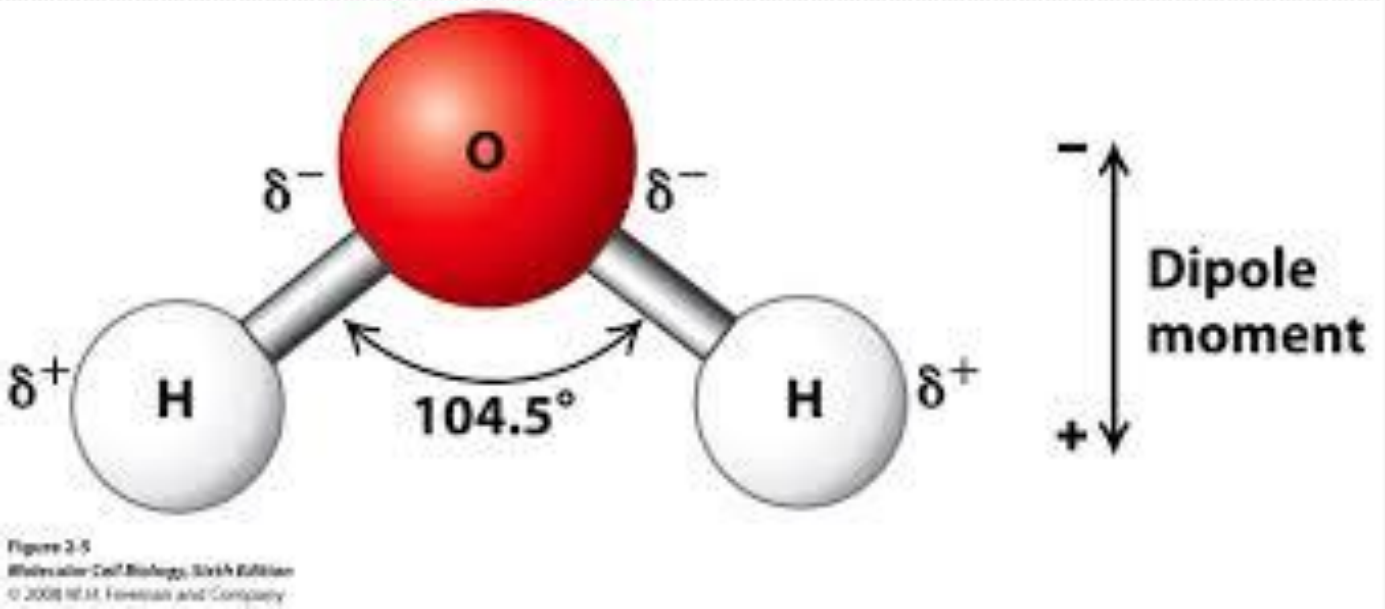
Hydrogen Bond





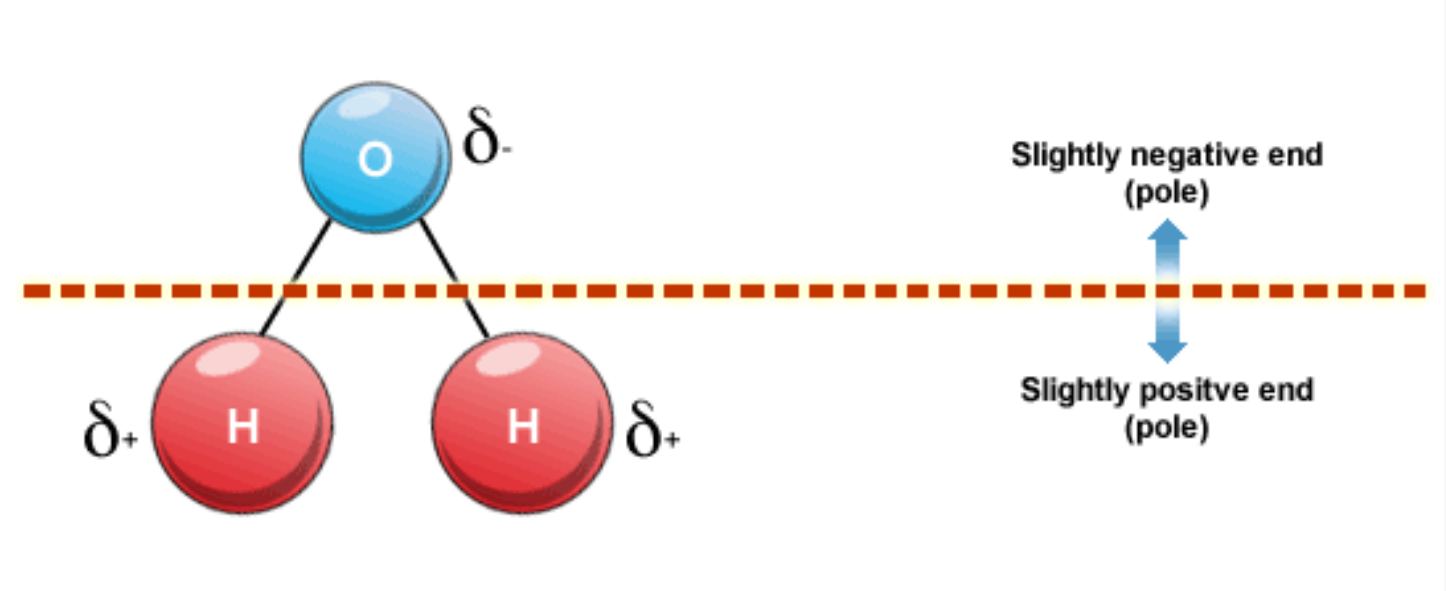
Polarity of Water Molecule

- Three atoms in the water molecule form an angle of 105˚ .



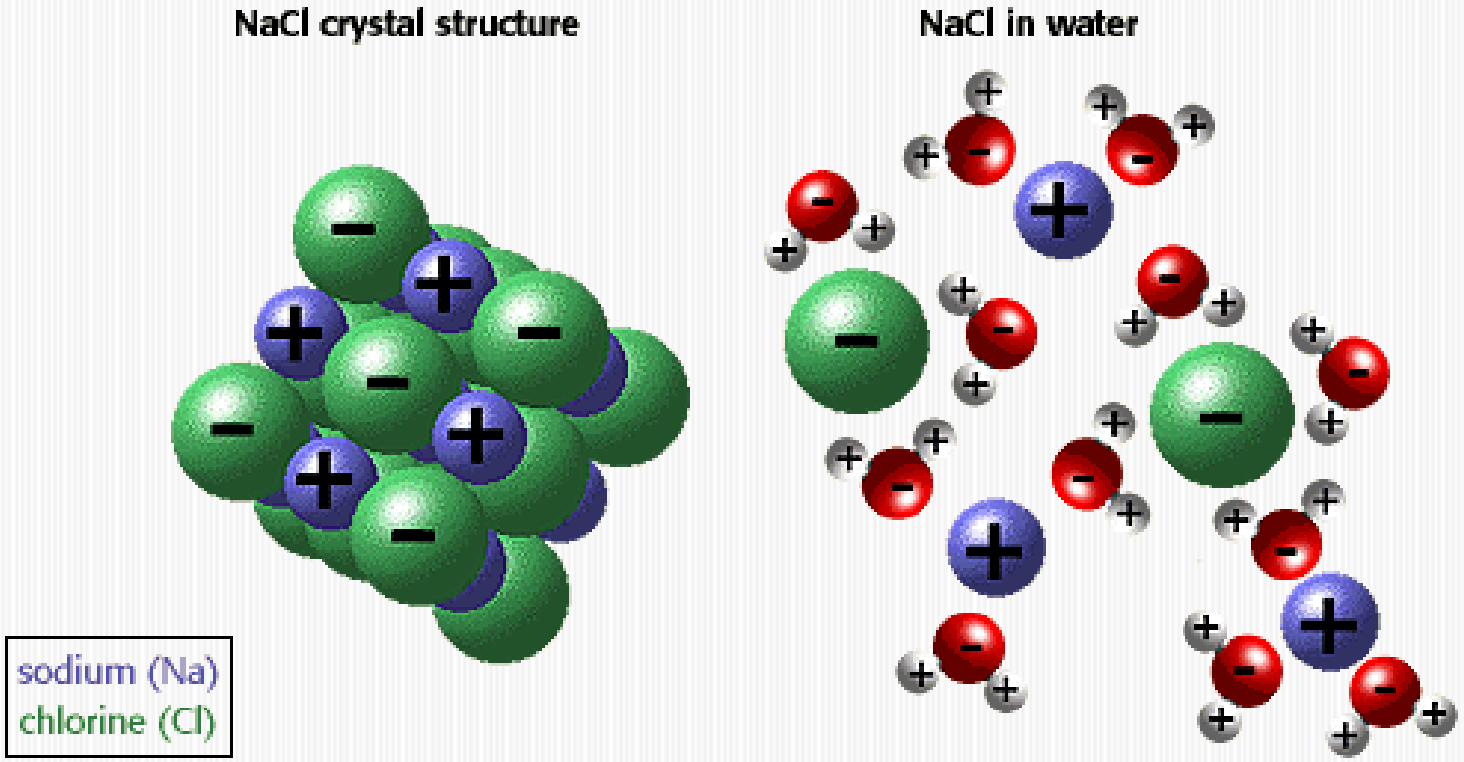
Polarity of Water Molecule

- Because of water's bent structure and the fact that the oxygen atom attracts the negative electrons more strongly than do the hydrogen atoms, the water molecule behaves like a dipole having opposite electrical charges at either ends.



Dissolution in Water

- The ability of ions and other molecules to be dissolved in water is due to polarity.



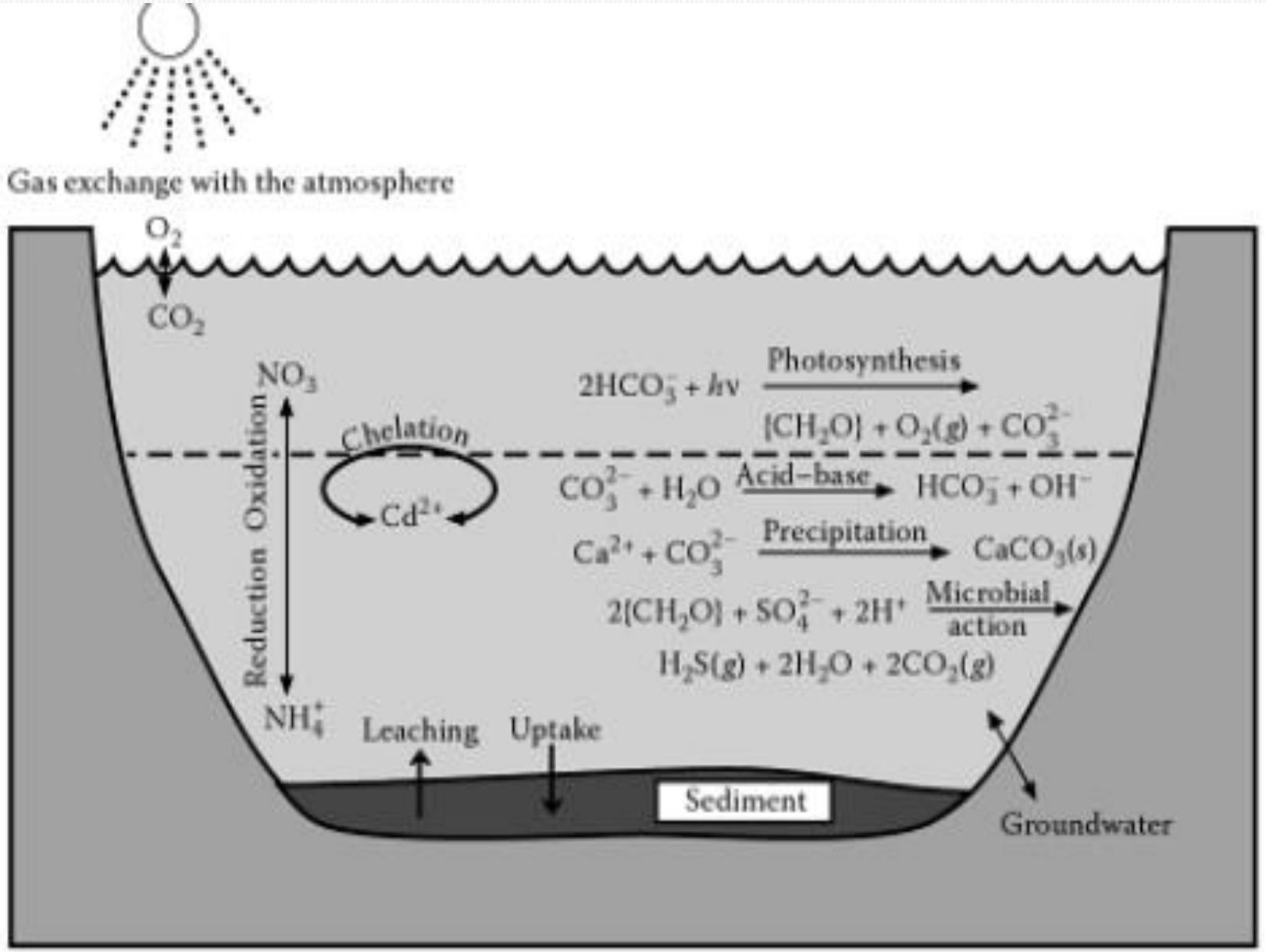
Major Aquatic Chemical Processes

- Aquatic environmental chemical processes involve –

  ✓ acid – base reactions
  ✓ solubility
  ✓ oxidation reduction reactions
  ✓ complexation reactions

- In aquatic environment, in addition to water, there are mineral phases, gas phases and living organisms.

Major Aquatic Chemical Processes



Major Aquatic Chemical Processes

- Most metals found in natural waters do not exist as simple hydrated cations, rather they remain in the form of polyneuclear species.
- The nature of chemical species in water containing bacteria or algae is strongly influenced by the action of these organisms.
- It is quite difficult to describe chemical phenomena in natural water systems.
- The system must described by simplified models, often based upon equilibrium concepts.