

## 2.2 Properties of Water

### KEY CONCEPT

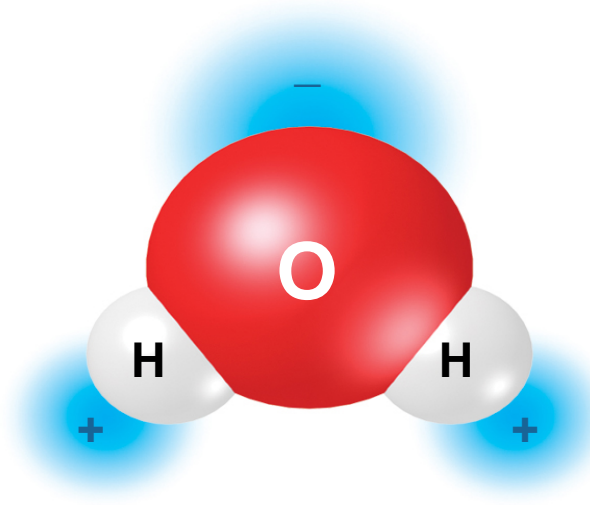
**Water's unique properties allow life to exist on Earth.**



## 2.2 Properties of Water

### ▶ Life depends on hydrogen bonds in water.

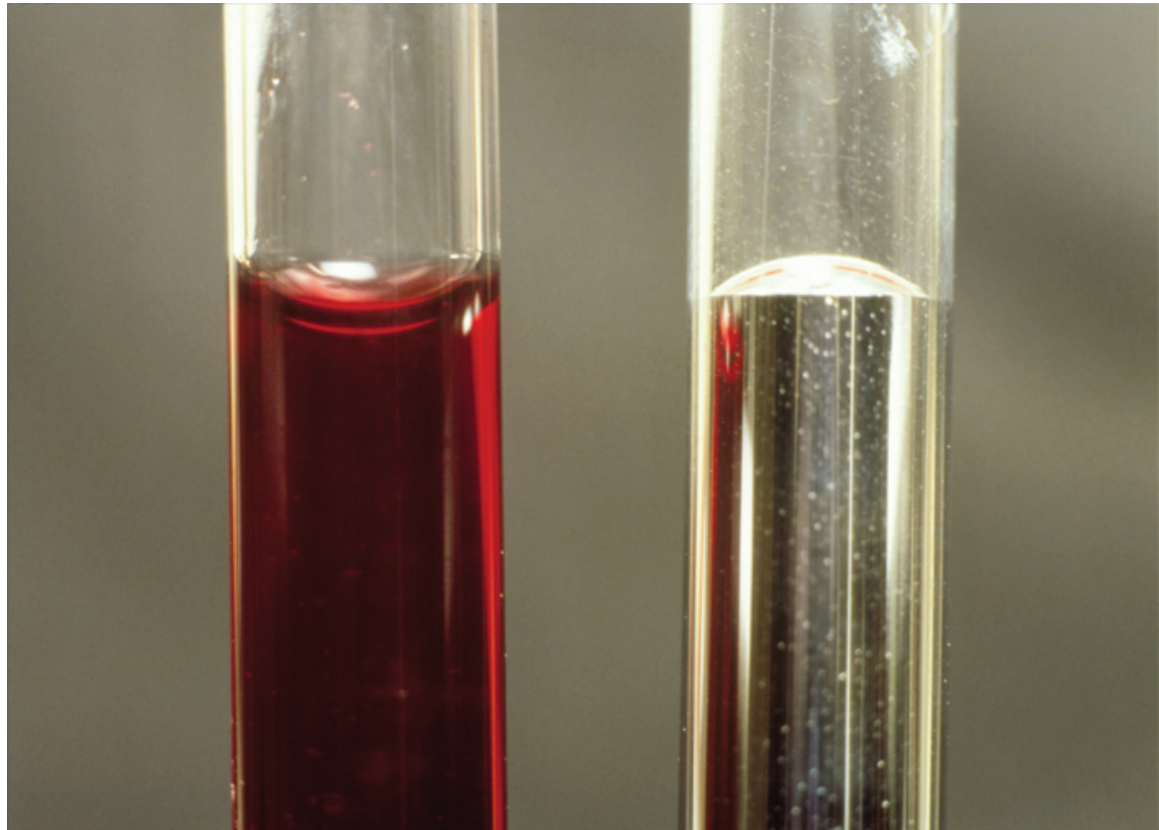
- Water is a polar molecule.
  - Polar molecules have slightly charged regions.



- Nonpolar molecules do not have charged regions.
- Hydrogen bonds form between slightly positive hydrogen atoms and slightly negative atoms.

## 2.2 Properties of Water

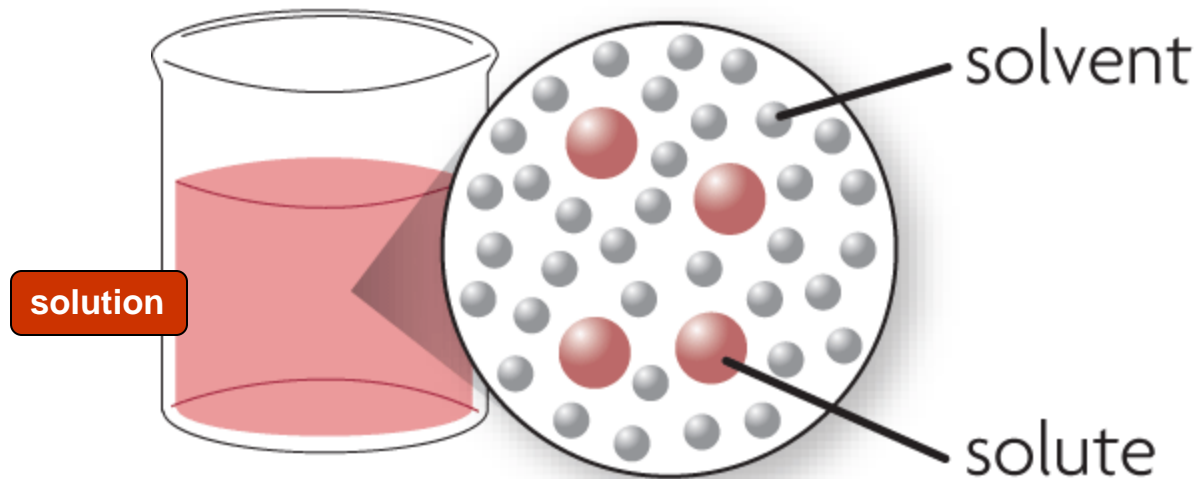
- Hydrogen bonds are responsible for three important properties of water.
  - high specific heat
  - cohesion
  - adhesion



## 2.2 Properties of Water

### ► Many compounds dissolve in water.

- A solution is formed when one substance dissolves in another.
  - A solution is a homogeneous mixture.
  - Solvents dissolve other substances.
  - Solutes dissolve in a solvent.





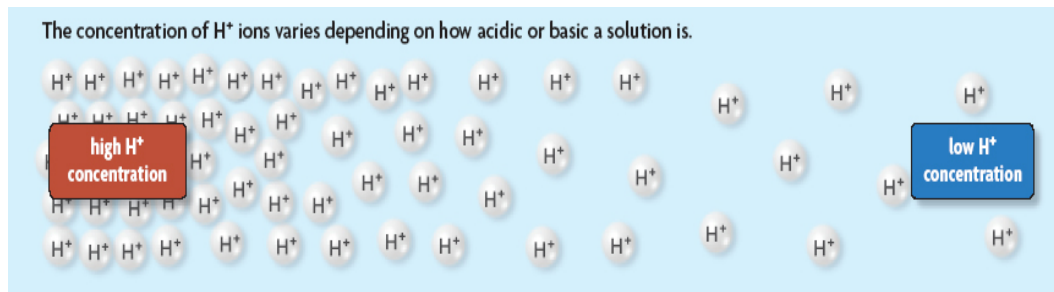
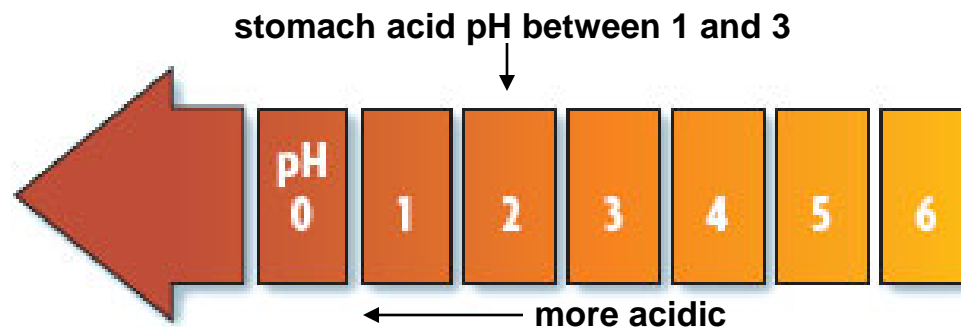
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- “Like dissolves like.”
  - Polar solvents dissolve polar solutes.
  - Nonpolar solvents dissolve nonpolar solutes.
  - Polar substances and nonpolar substances generally remain separate.

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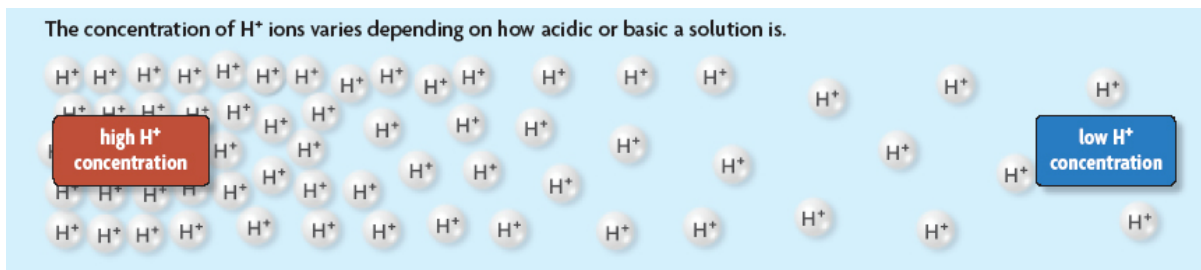
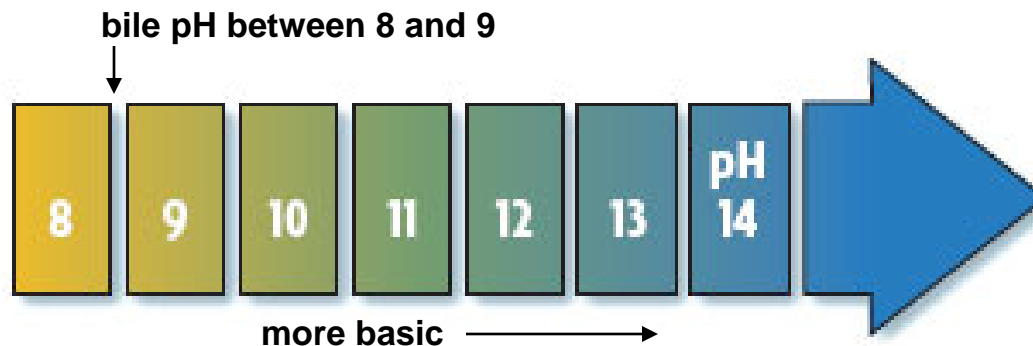
### ► Some compounds form acids or bases.

- An acid releases a hydrogen ion when it dissolves in water.
  - high  $H^+$  concentration
  - pH less than 7



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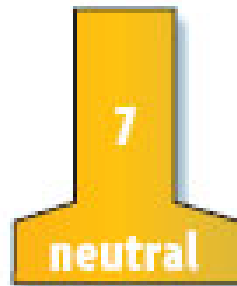
- A base removes hydrogen ions from a solution.
  - low  $H^+$  concentration
  - pH greater than 7



## 2.2 Properties of Water

- A neutral solution has a pH of 7.

pure water pH 7



The concentration of  $H^+$  ions varies depending on how acidic or basic a solution is.

