Chapter 3: Water

What results in the hydrogen bonding? Draw hydrogen bonding in water

 The polarity of water molecules results in hydrogen bonding.

What are the four properties of water?

1. cohesion-water’s affinity for itself

2. adhesion-water’s affinity for other substances

3. high specific heat-more energy is needed for water to change temperature than many other substances.

4. universal solvent-water dissolves all polar or charged molecules.

The following are a list of things that happen. What property of water allows this to happen?

Liquid clings to the wall of a glass

adhesion

You spill a drop of water

cohesion

Cooling down when you sweat

High specific heat

Ions dissolving in water

Universal solvent

When water forms a concave meniscus (U)

adhesion

When water forms a convex meniscus (upside down U)

cohesion

More energy is required to heat up water than another solution

High specific heat

Areas close to the sea are warmer during the winter and cooler during the summer.

High specific heat

Water forming a buffer system

Universal solvent

Two drops of water combining to form a bigger drop.

cohesion

A drop of water dispersing over a solid surface

adhesion

Taking longer for water to change phases than another substance.

High specific heat

Acid and Base stuff

**Water being a universal solvent** allows water to perform acid base chemistry.

What is pH? What is pOH?

pH=-log[H+] pOH=-log[OH-]

What is the concentration of hydroxide and hydronium ions equal to?

[H+][OH-]=10-14

You are given a solution with a concentration of 10^-4 hydronium ions. What is the concentration of hydroxide ions?

10-4(x)=10-14

x=10-10

What will water do when there is an excess of hydronium ions?

Water will accept H+ from solution

What will water do when there is an excess of hydroxide ions?

Water will donate H+ from solution

You are given a solution with a pH of 12. What is the concentration of hydroxide ions? What is the concentration of hydronium ions?

pH=12 pOH=2

12=-log[H+] 2=-log[OH-]

[H+]=10-12 [OH-]=10-2