

Water

Water is a polar inorganic compound that is at room temperature a tasteless and odorless liquid, nearly colorless with a hint of blue.

Water is an unusually good solvent for a large variety of substances, and is an essential component of all organisms, being necessary for most biological processes. Unlike most substances, water is less dense as ice than in liquid form; thus, ice floats on liquid water.

What is water in biology?

Water is one of the most unique molecules known to man and also one of the most important to biological systems. Not only does water exist in nature in all three states of matter (solid, liquid, gas), it also covers 75 percent of the earth and composes roughly 78 percent of the human body.

What is the function of water?

Your body uses water in all its cells, organs, and tissues to help regulate its temperature and maintain other bodily functions. Because your body loses water through breathing, sweating, and digestion, it's important to rehydrate by drinking fluids and eating foods that contain water.

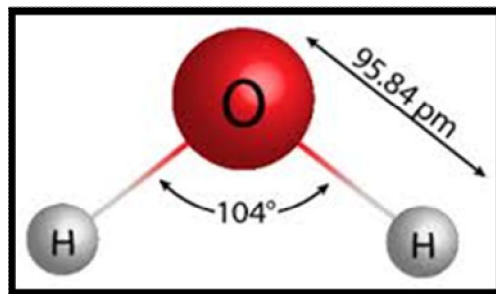
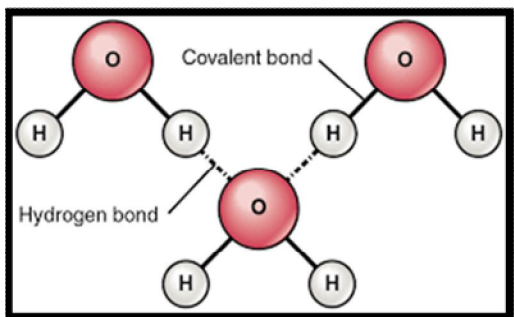
Structure of water

What is the molecular structure of water?

H₂O

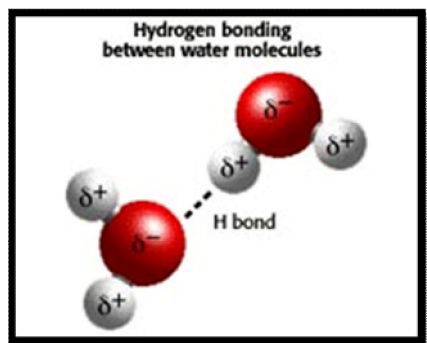
The water molecule exists in bent molecular geometry.

One molecule of water has two hydrogen atoms covalently bonded to a single oxygen atom.



The O-H bond lengths in the water molecule (H_2O) are 0.96 Å or 95.84 pm, and the H-O-H angle is 104.5° . The dipole moment of the water molecule is 1.85 D.

The presence of electrical dipoles (is a separation of positive and negative charges) on water molecule is responsible for their attraction.



Water - electronegative

The oxygen atom is more electronegative (it is better than hydrogen at attracting electrons, because it has more positively charged protons in its nucleus), and this makes it slightly more negative; consequently, the hydrogen atoms are unable to hold the electrons near to them, and become slightly more positive.

What happens to the hydrogen bonds when water freezes?

When water freezes, water molecules form a crystalline structure maintained by hydrogen bonding. Solid water, or ice, is less dense than liquid water. Ice is less dense than water because

the orientation of hydrogen bonds causes molecules to push farther apart, which lowers the density.

What are the basic properties of water?

- Its attraction to polar molecules.
- High-specific heat.
- High heat of vaporization.
- The lower density of ice.
- High polarity.