

Name: _____ Period: _____

Properties of Water Worksheet

Word Bank:

Covalent solvent deposition dissolve cohesion surface cooler universal
tension polar viscosity condensation negatively adhesion positively sublimation

1. The hydrogen and oxygen atoms are held together by covalent bonds.
2. The electrons are not shared equally creating a polar molecule.
3. The polarity of water allows it to dissolve most substances. Because of this it is referred to as the universal solvent.
4. Water molecules stick to other water molecules. This property is called cohesion.
5. Hydrogen bonds form between adjacent water molecules because the positively charged hydrogen end of one water molecule attracts the negatively charged oxygen end of another water molecule.
6. Water molecules stick to other materials due to its polar nature. This property is called adhesion.
7. surface tension creates the skin-like surface formed due to the polar nature of water.
8. viscosity is the tendency for fluids to resist flow.
cooler water is more viscous than warmer water, allowing floating organisms to use less energy to keep from sinking.
9. condensation is when water changes from a gas to a liquid.
10. sublimation is when water changes from a solid directly to a gas.
11. deposition is when water changes from a gas directly to a solid.
12. Why does ice float?

water is less dense in solid form because hydrogen bonding between water molecules pushed molecules further apart into a set crystalline pattern

13. List the properties that ocean water has due to the fact that it contains salt.

higher density
conductivity
decreased surface tension

Life as we know it could not exist without water. All the chemical reactions of life occur in aqueous solution. Water molecules are polar and are capable of forming hydrogen bonds with other polar or charged molecules. As a result, water has the following properties:

- A. H₂O molecules are cohesive; they form hydrogen bonds with each other.
- B. H₂O molecules are adhesive; they form hydrogen bonds with polar surfaces.
- C. Water is a liquid at normal physiological (or body) temperatures.
- D. Water has a high specific heat.
- E. Water has a high heat of vaporization (energy needed to evaporate).
- F. Water's greatest density occurs at 4°C.

Explain how these properties of water are related to the phenomena described in parts a-h below. More than one property may be used to explain a given phenomenon.

14. During the winter, air temperature in the northern United States can remain below 0°C for months; however, the fish and other animals living in the lakes survive.

D and F

15. Many substances - for example, salt (NaCl) and sucrose - dissolve quickly in water.

B

16. When you pour water into a 25-ml graduated cylinder, a meniscus forms at the top of the water column.

A and B

17. Sweating and the evaporation of sweat from the body surface help reduce a human's body temperature.

E and C

18. Water drops that fall on a surface tend to form rounded drops or beads.

A

19. Water drops that fall on your car tend to bead up or round up more after you polish (or wax) that car than before you polished it.

A

20. If you touch the edge of a paper towel to a drop of colored water, the water will move up into (or be absorbed by) the towel.

B (and capillary action)