Physical Properties of Water

Some important physical properties of water are as follows:

Nature: Water is an odorless, tasteless, transparent liquid. However, the taste of water is attributes to the presence of dissolved salts in it. Volatile impurities also impart some odour to water. Water is colourless in thin layers but it appears bluish in thick layers.

Freezing point: The freezing point of water is 0° C under normal atmospheric pressure. The freezing point of water decreases with an increase in external pressure. Presence of soluble impurities decreases the freezing point of water.

Boiling point: The boiling point of pure water is 100°C under normal atmospheric pressure. The boiling point of water gets elevated due to the presence of soluble impurities. Increase in external pressure increase the boiling point of water.

Density: The maximum density of water is 1 gm. /cc and is obtained at 4°C. The density of water increases with increase in temperature up to 4° C. Later, density of water decreases with increase in temperature beyond 4 C. Water shows a unusual behaviour between 0° C to 4 C. In this range of temperature, water expands on cooling instead of contracting. This phenomenon of unusual expansion of water between O° C to 4° C is called anomalous expansion.

Conductivity: Pure water is a bad conductor of heat and electricity. The electrical conductivity of water is due to the presence of dissolved salts in water.

Specific heat: The amount of heat energy required to raise the temperature of unit mass of a substance through 1 C or 1K is called specific heat capacity of the substance. Specific heat capacity of pure water is 1 calorie/gram = 4.2 joule/gram. Water has the highest specific heat capacity among all the substances.

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Solvent: The significant of 'solutions' in chemistry originates from the universal solvent property of water. Water can dissolve many substances in it due to its high dielectric constant. Dielectric constant is the property of a solvent to reduce the force of attraction between the ions (Cations and anions) of inorganic compounds. It can also dissolve a large number of organic compounds like glucose, sugar, alcohol etc. Due to the ability to dissolve a wide range of substances in it, water is called the universal solvent.