FEATURES OF WATER

Water has many unique properties, many of which are based on its molecules' ability to form hydrogen bonds. Water is found at earths temperature as a solid, liquid and gas. It has a high specific heat capacity and boiling point. Water has a strong surface tension.All this unique features of water are important to daily life. Water is doubtedly one of the essential compounds Al on planet earth. It plays a critical role in the bodies of living things. Pure water is colourless, odourless, and tasteless. Like any other chemical substances, it has unique features that distinguish it from the rest.

Firstly, water is polar. In chemical bonding, polarity refers to the distribution of electric charges over the atoms joined by a bond. Water has simple molecular structure. It is composed of one oxygen atom and two hydrogen atoms. Each hydrogen atom is covalently bonded to the oxygen via a shared pair of electrons.Thus four pairs of electrons surrounding the oxygen atom two pairs involved in covalent bonds with hydrogen and two unshared pairs on the opposite side of the oxygen atom. Oxygen is an ”electronegative”atom compared with hydrogen.Water is a polar molecule meaning that there is an uneven distribution of electron density .Water has a partial negative charge near the oxygen atom due to the unshared pairs of electrons and partial positive charges near the hydrogen atoms. An electrostatic attraction between the partial positive charge near the hydrogen atoms and the partial negative charge near the oxygen results in the formation of a hydrogen bond. The ability of ions and other molecules to dissolve in water is due to polarity.

Secondly, water is a universal solvent because most substances dissolve in it. This is one of the special properties of water and its made possible because of its polar characteristics. Considering that water is slightly charged at the ends , it can dissociate ionic compounds . dissociation refers to the separation of negative and positive ionic compound.When an ionic compound is put in water , it dissociates into positive and negative ions. The positive ions are attracted towards oxygen which is negatively charged and the negative ions are attracted towards hydrogen which is positively charged and dissolution takes place.However, being a universal solvent it should not be confused that it dissolves every substance some organic substances do not dissolve in water.

Thirdly water has a high surface tension. Surface tension is a measurement of the amount of force required to break this skin on the surface of water other liquids have a surface tension as well, but the surface tension in water is quite strong due to the hydrogen bonds. Water has high tension due to the hydrogen bonding in the water molecules and the cohesive forces in water. The stronger cohesion between the water molecules to the air makes it more difficult to move an object through its surface than to move it when completely submerged in it.

Fourth, water has specific heat capacity. Specific heat capacity is the amount of required to raise the temperature of one gram of a substance by one degrees celcius. Every substance has its own specific heat capacity. The specific heat capacity of water is much higher than that of other substances. This means that it takes a lot more heat to raise the temperature of water compared to the amount of heat it would take to heat other substances.The specific heat of water helps the earths temperature remain moderate since water traps heat during the day and slowly releases it during the night, as a result the temperatures of the earth does not vary very widely.

In addition to that, water is less dense as a solid than as a liquid. Density is the amount of matter contained in a given volume by mass.Water becomes less dense when heated and more dense when cooled. So if water is cooled ,it becomes more dense and forms ice . Water is one of the few substances whose solid state can float on its liquid state.When freezing molecules within water molecules begin to move around more slowly ,making them easier to make hydrogen bonds and eventually arrange these into an open crystalline ,hexagonal structure as the water molecules are more tightly packed in waters liquid state than in its solid state. While its rare to find a compound that lacks carbon to be a liquid standard temperatures and pressures. So its unusual for water to be a liquid at room temperature. Water is a liquid at room temperature so its able to move around quicker than its in solid, enabling the molecules to form a fewer hydrogen bonds resulting in the molecules being packed more closely together.However they are able to move freely and slide past each other while ice forms a solid.Water can exist in different states, at standard temperature and pressure water is a liquid .When its temperatures are lowered to its freezing point it changes to solid and its form can also be change gaseous state when its temperatures are increased beyond its boiling point.

Adding to that,plants and trees couldn't thrive without capillary action. It helps bring water up into the roots . With the help of adhesion and cohesion, water can work its way all the way upto the branches and leaves . It is defined as the movement of water within spaces of a porous material due to the forces of adhesion, cohesion, and surface tension. Capillary action occurs because water molecules are sticky than to the forces of cohesion. Adhesion of water to the walls of a vessel will cause an upward force on the liquid at the edge and these results to formation of a meniscus which turns upwards.The surface tension acts to hold the surface intact . Capillary action occurs when adhesion to the walls is stronger than the cohesive forces between the liquid molecules.The height to which capillary action will take water in a uniform circular tube is limited by surface tension.Water's high surface tension is due to hydrogen bonding in water molecules.

Lastly,water has different boiling and freezing points.Boiling refers to the temperetures at which the atmospheric pressure exerted by the surrounding upon a liquid is equivalent to the pressure exerted by the vapour of the liquid ,extra heat causes the transformation of the liquid into its vapour form without raising the temperature. On the other hand, the freezing point is the point at which a liquid begins to turn into a solid. Considering that water can exist in three states of matter and it has specific boiling and freezing points. Pure water boils at 100 degrees celcius, and the temperature above that converts it into gaseous state . It freezes at zero degrees celcius , and temperatures below that will solidify it.

In conclusion, water is a chemical substance with a chemical formula H_2O, one molecule of water has two hydrogen atoms covalently bonded to single oxygen atom. The major part of the earth is covered by water.We need water for almost everything. Water is unevenly distributed on the earths surface .It forms a major solven and dissolves almost every popular solute.