



Water

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WHAT IS WATER

- Have you ever heard someone refer to water as H₂O? Why do you suppose someone might call water by this name? What is water? Water is a basic molecule made up of two hydrogen atoms and one oxygen atom. When these three atoms come together, they form a strong bond that is difficult to break. The strength of this bond keeps a water molecule together for millions and even billions of years.

WATER AS A SOLVENT

- Of all common liquids, water is the best solvent. Rain water is the purest form of water. As rainwater runs down the hill sides with great force, many minerals get dissolved in it. This water is collected in lakes or reservoirs from where for we get water for drinking purposes and domestic use. This water contains invisible impurities, such as dissolved materials(soluble substances) and germs which can be present in clean water.

- The soluble substances can be removed from water by : Evaporation and Distillation

- EVAPORATION

- **Evaporation** is a type of vaporization of a liquid that occurs from the surface of a liquid into a gaseous phase that is not saturated with the evaporating substance. The other type of vaporization is boiling, which is characterized by bubbles of saturated vapor forming in the liquid phase. Steam produced in a boiler is another example of evaporation occurring in a saturated vapor phase. Evaporation that occurs directly from the solid phase below the melting point, as commonly observed with ice at or below freezing or moth crystal, is called sublimation..

○ DISTILLATION

- *Distillation is a process of separating the component substances from a liquid mixture by selective evaporation and condensation. Distillation may result in essentially complete separation (nearly pure components), or it may be a partial separation that increases the concentration of selected components of the mixture. In either case the process exploits differences in the volatility of mixture's components. In industrial chemistry, distillation is a unit operation of practically universal importance, but it is a physical separation process and not a chemical reaction.*

INSOLUBLE SUBSTANCES IN WATER

- Water has many things which cannot dissolve in it . This is called as insoluble.
- Insoluble substances can be removed by: sedimentation decantation filtration
- Sedimentation:
- **Sedimentation** is the tendency for particles in suspension to settle out of the fluid in which they are entrained, and come to rest against a barrier. This is due to their motion through the fluid in response to the forces

- acting on them: these forces can be due to gravity, centrifugal acceleration or electromagnetism. In geology sedimentation is often used as the polar opposite of erosion, i.e., the terminal end of sediment transport. In that sense it includes the termination of transport by saltation or true bedload transport . Settling is the falling of suspended particles through the liquid, whereas sedimentation is the termination of the settling process.

○ Decantation

- *Decantation* is a process for the separation of mixtures, by removing a layer of liquid, generally one from which a precipitate has settled. The purpose may be either to produce a clean decant, or to remove undesired liquid from the precipitate (or other layers). If the aim is to produce a clean solution, a small amount of solution must generally be left in the container, and care must be taken to prevent any precipitate from flowing with the solution out of the container.

FILTRATION

- **Filtration** is commonly the mechanical or physical operation which is used for the separation of solids from fluids (liquids or gases) by interposing a medium through which only the fluid can pass. The fluid that passes through is called the filtrate. Oversize solids in the fluid are retained, but the separation is not complete; solids will be contaminated with some fluid and filtrate will contain fine particles (depending on the pore size and filter thickness). Filtration is also used to describe some biological processes, especially in water treatment and sewage treatment in which undesirable constituents are removed by absorption into a biological film grown on or in the filter medium as in slow sand filtration