Separating insoluble solids from liquids:

1. Sedimentation and Decantation: the process of settling down of heavier insoluble particles at the bottom of a liquid is called sedimentation. The heavier insoluble particles that settle down at the bottom of the liquid are called sediment. The process of pouring out a clear liquid from a vessel (after sediment), without disturbing the sediment (heavy, insoluble settled particles) is called decantation. For example; muddy water contains soil and sand in water. Soil and sand; being insoluble in water; settle down at bottom if water is allowed to stand for some time.
2. Loading: the process of increasing the rate of sedimentation in a suspension, by adding some chemicals to it, is called loading. Alum is soluble in water. The particles of alum entangle suspended clay particles and make them heavier. Thus, clay particles settle down rapidly.
3. Filtration: the process of separating insoluble substances from a liquid, using a filter is called filtration. Tea strainer has a wire mesh in it that acts as a filter. The liquid tea passes through the small holes and used tea leaves are left in the tea strainer. The particles of mud are too small and can pass through the holes along with water. For this, we need a fine filter such as filter paper. A filter paper is a piece of special paper that has millions of tiny holes in it. Uses of filtration:

a. Fruits and vegetables juices are usually filtered to separate seeds and pulp.
b. For making paneer, lemon is added to the boiling milk. It forms a mixture that consists of particles of solid paneer and a liquid. The paneer is then separated from the liquid through a fine filtering cloth or a strainer.

How is water treated before distribution by water works department?

1. Sedimentation and decantation is first done to remove larger particles of impurities.
2. Alum is then added to the water to separate the smaller particles by loading
3. The water is then filtered by passing through sand filters.
4. Germs are killed by adding chlorine to the water.

Separating soluble solids from mixture:

Evaporation: The process of conversion of liquid into its vapour is called evaporation. In this method liquid is heated the liquid part of the mixture evaporates leaving behind the solid part. We can separate common salt dissolved in water by evaporation. The process of conversion of a solid into vapour without converting into liquid state is called sublimation.

Separating liquid from mixture:

Condensation: The process of conversation of water vapour into its liquid called condensation. It is opposite to evaporation. In nature water vapours in the air condense to form liquid i.e. dew. Condensation takes place only when water vapours hit the cold surface. Evaporation and condensation are used for separating a soluble solid from water. For example; salt can be separated from a solution of salt and water; by using the combination of evaporation and condensation.

Salt is prepared from sea water by evaporation and condensation. Sea water is collected in shallow pits and allowed to evaporate. The water evaporates and

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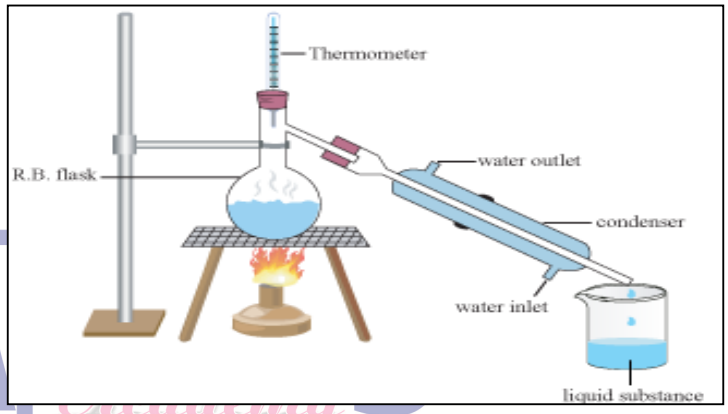
crystals of salt are obtained in the pits. The salt is then sent to factories for further purification.

The process to form Salt from Sea Water:

1. Seawater has salt dissolved in it.
2. To obtain salt, seawater is collected in a pit and allowed to stand
3. Sun's heat evaporates the water. Salt, which is left behind, is collected.
4. After purification salt is ready to use.

Distillation: It is a method of obtaining pure liquid from a solution. The solution is heated so that the liquid evaporates. The vapours are then cooled. They condense to give pure liquid. A special apparatus is used to get distilled water. Water containing dissolved impurities is kept in a flask. An apparatus called the Liebig's condenser is fitted to the flask to cool the water vapour. Cold water is made to flow through the condenser. As the water in the flask is heated, it evaporates. The water vapours cool and condense in the condenser. The drops of distilled water formed are collected in another flask.



Solution and Solubility:

Dissolving is the change where substances mix completely with the liquid they have been added to. Not all substances dissolve in water. Only some substance such as salt sugar dissolves in water. They are known as soluble substances. The substances that do not dissolve in water are known as insoluble substances. In a solution of salt and water, salt is called solute and water is called solvent. A solute and solvent together form a solution.

Water can dissolve a large number of substances so it is called a universal solvent. The plants can absorb nutrients from the soil only when they are soluble in water. Minerals from roots and food from leaves can only be transported to different parts as they are in a solution form. The aquatic animals can survive in water as gases like oxygen and carbon dioxide are soluble in water.

Saturated Solution: When a solution of a liquid and solid has enough of the solid and it cannot take any more solid; the solution is called saturated solution. On the other hand, when more solid can be dissolved in the given solution; it is called unsaturated solution. Solubility is the ability of a substance to get dissolved in a given liquid. The quantity of a substance that can be dissolved in hot water is much more than in cold water. Solubility of gases in water decreases with increase in temperature. Factors which increase the solubility are:

1. Stirring: A solute dissolves faster in a solvent when it is stirred.

2. Solute in Powdered Form: A solute dissolves faster in a solvent when it is in the powdered form.