

L.No: 01

Topic: Water and its Treatment - Introduction,  
Sources and impurities

Introduction:

\* Water is the most important compound for the existence of human beings, animals and plants.

\* Main sources of water are

✓ Rain water

✓ Surface water

✓ Underground water

✓ Sea water

\* The above sources of water, rain water is the most pure form, but it is very difficult to collect and store it.

\* Sea water is the most impure form. So, the surface water and underground water are used for domestic, as well as industrial purposes.

\* The process of removing all types of impurities from water and making it fit for domestic (or) industrial purposes is called water treatment.

# Types of impurities in water

## Impurities

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### Physical Impurities

### Chemical Impurities

### Biological Impurities

a) Suspended Impurities

a) Dissolved Salts

b) Colloidal Impurities

b) Dissolved gases

### Physical Impurities:

a) Suspended Impurities like Sand, oil droplets, Vegetable and animal matter, gives turbidity to water.

b) Colloidal Impurities like finely divided silica clay and organic waste products impart Colour, Odour and taste to water.

### Chemical Impurities:

a) Dissolved Salts like bicarbonates, Sulphates and Chlorides of Calcium and Magnesium and Carbonates, bicarbonates of Sodium and Potassium.

\* Dissolved Magnesium and Calcium Salts in water cause "hardness" whereas alkali Salts (bicarbonates, Carbonates of potassium and Sodium and bicarbonates of Calcium and Magnesium) make the water "alkaline".

b) Dissolved gases like Oxygen, Carbon dioxide Hydrogen Sulphide, Sulphur dioxide make

the water "acidic". So they accelerate the rate of Corrosion.

Biological Impurities like fungi, bacteria and other microorganisms cause diseases.

#### \* Dissolved Impurities

##### a) Inorganic Salts

eg:

i) Cations:  $Ca^{2+}$ ,  $Mg^{2+}$ ,  $Na^+$ ,  $K^+$

ii) Anions:  $Cl^-$ ,  $SO_4^{2-}$ ,  $NO_3^-$

b) Gases. eg:  $CO_2$ ,  $O_2$ ,  $N_2$

##### c) Organic Salts

#### \* Colloidal Impurities

Clay and finely divided silica

Colloidal particle of  $10^{-4}$  -  $10^{-6}$  mm size.

#### \* Micro Organisms.

Note:

Suspended impurities give turbidity and colour to water. Microorganisms are the main cause of water-borne diseases.