

# **WATER POLLUTION and CONTROL**

## Biological Oxygen Demand (BOD)

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The quantity of oxygen used up by microorganisms at 21°C and in darkness during 5 days in breaking down organic wastes in a water body is called its **biological oxygen demand (BOD)**.

It is this amount of oxygen which is defined as **biological oxygen demand (BOD)**. The BOD value of an aquatic system depends upon:

- the type and amount of organic waste
- the organisms acting on it
- temperature
- pH

## Water quality variables

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### \* **Temperature:**

The temperature of surface waters is influenced by **latitude, altitude, season, time of day, air circulation, cloud cover and the flow and depth of the water body.**

Temperature affects physical, chemical and biological processes in water bodies and, therefore, the concentration of many variables.

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**Conductivity, or specific conductance,** is a measure of the ability of water to conduct an electric current. It is sensitive to variations in dissolved solids, mostly mineral salts.

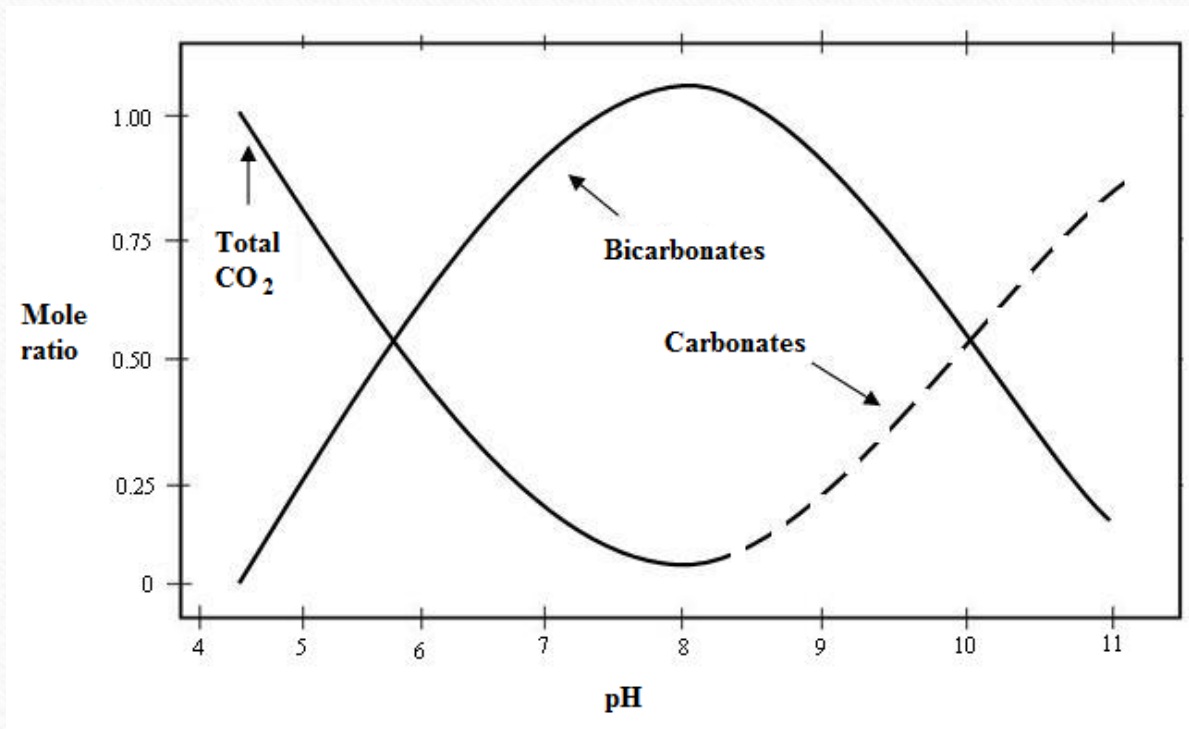
The degree to which these dissociate into ions, the amount of electrical charge on each ion, **ion mobility and the temperature of the solution** all have an **influence on conductivity.**

## pH

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The pH is an important variable in water quality assessment as it influences many biological and chemical processes within a water body and all processes associated with water supply and treatment.

The pH is a measure of the acid balance of a solution and is defined as the negative of the logarithm to the base 10 of the hydrogen ion concentration. The pH scale runs from 0 to 14, with pH 7 representing a neutral condition.



## Acidity Alkalinity

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Acidity and alkalinity are the base- and acid-neutralising capacities of water and are usually expressed as  $\text{mmol l}^{-1}$ .

When the water has no buffering capacity they are inter-related with pH.

The **acidity of water is controlled by** strong mineral acids, weak acids such as carbonic, humic and fulvic, and hydrolising salts of metals, as well as by strong acids.

## Dissolved Oxygen

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**Oxygen** is essential to all forms of aquatic life, including those organisms responsible for the self-purification processes in natural waters.

The oxygen content of natural waters varies with temperature, salinity, turbulence, the photosynthetic activity of algae and plants, and atmospheric pressure.



## Redox Potential

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The **redox potential (Eh)** characterises the oxidation-reduction state of natural waters.

Ions of the same element but different oxidation states form the redox-system which is characterised by a certain value.

Organic compounds can also form redox-systems.

## References

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Anonymous 1996. Water Quality Assessments - A Guide to Use of Biota, Sediments and Water in Environmental Monitoring - Second Edition Ed. by Deborah Chapman 651 pages published on behalf of WHO by F & FN Spon 11 New Fetter Lane London EC4) 4EE.

Taken from <http://www.nios.ac.in/media/documents/313courseE/L34.pdf>