CBSE Class 7 Science Notes Chapter 5 Acids, Bases and Salts

In our daily life, we use a large number of edible substances such as lemon, baking soda, tamarind, common salt, sugar, curd and vinegar. Some of these substances taste sour, some taste bitter, some taste sweet and some taste salty.

Acids, bases and salts are the three important groups of chemical substances that are used by us in different ways. Some of

the acids, bases and salts occur in nature and they can be made artificially in factories also.

Edible substances and their tastes

Substance	Taste (Sour/Bitter/Any other)
Lemon Juice	Sour
Orange Juice	Sour
Vinegar	Sour

Curd	Sour
Tamarind(imli)	Sour
Sugar	Sweet
Common Salt	Salty
Amla	Sour
Baking Soda	Bitter
Grapes	Sweet/Sour

Acids and Bases

The word acid has been derived from a Latin word ‘acidus’ which means ‘sour’. Thus, all sour substances essentially contain acids. Substances like lemon juice, orange juice, unripe mango and curd taste sour. They taste sour because they contain substances called acids in them. The chemical nature of such substances is acidic. The acids in these substances are natural acids.
However, there are other substances like baking soda it does not taste sour.

It means that it has no acids in it. It is bitter in taste. And if prepare a solution of baking soda

in water and rub it between your fingers, it feels soapy. Substance like these which are bitter in taste and feel soapy on touch are known as bases. The chemical nature of such substances is said to be basic. All the acids mentioned in table occur in nature.

Acids and their Sources

Name of Acid	Found in
Acetic Acid	Vinegar
Formic Acid	Ant's Sting

Citric Acid	Citrus fruits such as oranges, lemons, etc..
Lactic Acid	Curd
Oxalic Acid	Spinach
Ascorbic Acid(Vitamin C)	Amla, Citrus fruits
Tartaric Acid	Tamarind, grapes, unripe mangoes, etc..

Bases and their Sources

Bases and their Sources

Name of Base	Found in
Calcium Hydroxide	Lime Water
Ammonium Hydroxide	Window Cleaner
Sodium Hydroxide/Potassium Hydroxide	Soap

Natural Indicators Around Us

It is not safe to taste every substance to find out if it is acidic or basic. There are some special substances that have different colours in acidic and basic mediums. These substances are known as indicators. The indicators change their colour when added to a solution containing an acidic or a basic substance.

Some naturally occurring indicators are

litmus, turmeric, China rose petals (gudhal) and red cabbage juice. These indicators show different colours in acidic and basic media. They are used to test whether a substance is acidic or basic in nature.

Litmus- A Natural Dye

A naturally occurring indicator, i.e. litmus is obtained from certain lichens (small plants) and used as a dilute solution. Litmus has mauve (purple) colour in water. In an acidic solution, it turns red. When it is added to a basic solution, it turns blue. Usually, it is available as a red and blue litmus paper.

Turmeric is Another Natural Indicator

Turmeric is a bright yellow powder obtained from a plant. It is is called ‘Haldi’ in Hindi. Turmeric contains a yellow dye. Turmeric turns red in basic solution. It is used as indicator in the form of turmeric paper.

China Rose as an Indicator

China rose is a natural indicator. It is called ‘Gudhal’ in Hindi. It is a extracted from the red flowers of China rose plant with water.

Acid Rain

The rain containing excess of acids called an acid rain. The rain becomes acidic because carbon dioxide, sulphur dioxide and nitrogen dioxide dissolve in rain drops to form carbonic acid, sulphuric acid and nitric acid respectively. It can cause damage to buildings, historical monuments, plants and animals.

This happens as follows:

- Acid rain makes the water of lakes, ponds and rivers too acidic due to which fish and other aquatic animals get killed.
- Acid rain eats up the leaves of the trees

gradually. By losing leaves, the trees die. Acid rain also damages crop plants in the fields.

- Acid rain damages the metal structures like steel bridges, etc when it falls on them.
- Acid rain damages the surfaces of buildings and monuments made up of marble.

Neutralisation

Acids and bases are chemically opposite substances. So, when an acid is mixed with a base, they neutralise (or cancel) the effect of each other. When an acid solution and a base solution are mixed in suitable amounts, both the acidic nature of the acid and the basic nature of the base are destroyed. The resulting solution is neither acidic nor basic. So, the reaction between an acid and base is known as neutralisation. In the process of neutralisation, salt and water are produced with the evolution of heat.

Salt produced in the reaction may be acidic,

basic or neutral in nature. The evolved heat raises the temperature of the reaction mixture.
Acid + Base → Salt + Water (Heat is evolved)
e.g. Hydrochloric acid (HCl) (Acid) + Sodium hydroxide (NaOH) (Base) → Sodium chloride (NaCl) (Salt) + Water (H2O)

If dilute sulphuric acid is added to lime water (which is a base), then neutralisation reaction takes place and the reaction mixture becomes hot.
We are going to use an indicator which you have not used so far. It is called phenolphthalein.

Note: Phenolphthalein is an indicator used in the neutralisation process. When the solution is basic, phenolphthalein gives a pink colour but if the solution is acidic, it remains colourless.

Neutralisations in Everyday Life

The neutralisation reactions involving acids and bases play a very important role in our everyday life. The treatment of an ant's sting, remedy for indigestion, soil treatment and the treatment of factory wastes, all involve neutralisation reaction.

Indigestion

estion. Due to indigestion, sometimes a person feels pain in the stomach and irritation. To relieve indigestion, we take an antacid such as milk of magnesia. Milk of magnesia contains a base called magnesium hydroxide. Magnesium hydroxide neutralises the excess acid present in the stomach and cures indigestion. Another antacid is baking soda which contains a base sodium hydrogen carbonate.