

CHAPTER 02

ACIDS AND BASES

Indicators

An indicator is a dye that changes color when put into an acid or base. An indicator gives different colors in acid and base. They help to study the acidic or basic properties of substances.

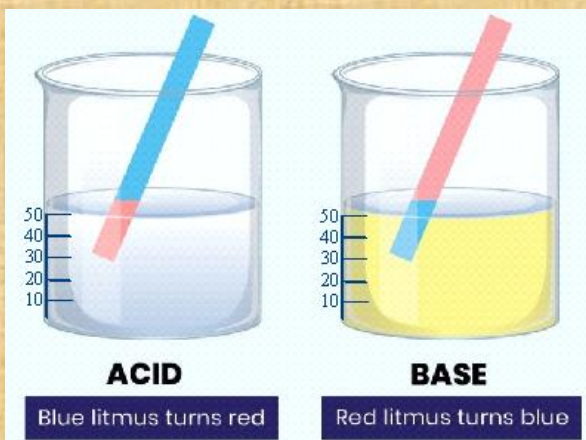
These indicators may be natural or synthetic.

Natural indicators include litmus and turmeric papers.

Litmus paper is the most commonly used indicator in laboratories.

- When an acid added to the blue litmus paper, it turns red indicating acidic nature of the solution.
- When a base added to the red litmus paper, it turns blue indicating the basic nature.

For example, a drop of lemon juice changes the color of blue litmus paper to red, indicates the presence of acid.



If a drop of baking soda added to the red litmus paper, it turns blue color indicating the presence of base.

Turmeric is used as indicator in the form of turmeric paper. Turmeric turns red in basic solution.



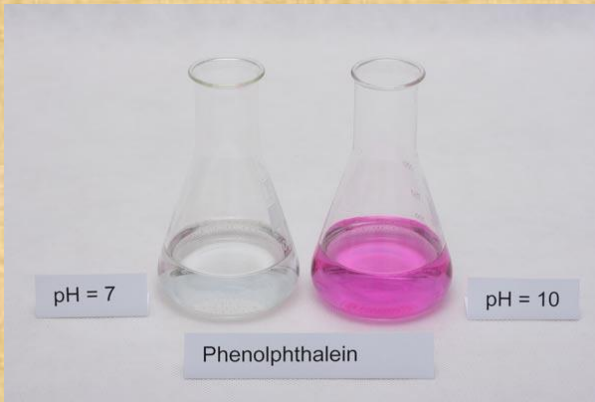
For example, a yellow stain of curry on white shirt turns red when soap is applied. This is due to the basic nature of soap solution, which changes the color of turmeric in curry stain to red.

Synthetic indicators include methyl orange and phenolphthalein.

Methyl orange gives red color in acidic solutions and yellow color in basic solutions. It remains orange in neutral solutions.



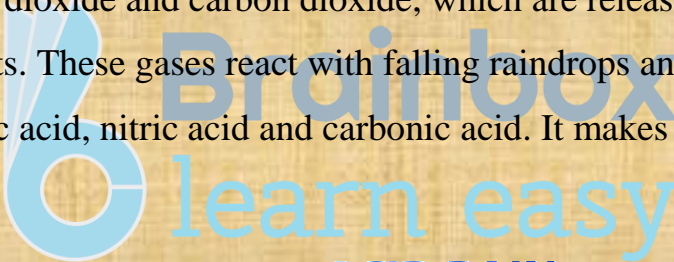
Phenolphthalein remains colorless on acidic solutions and gives light pink color in basic solutions. It remains colorless in neutral solutions.



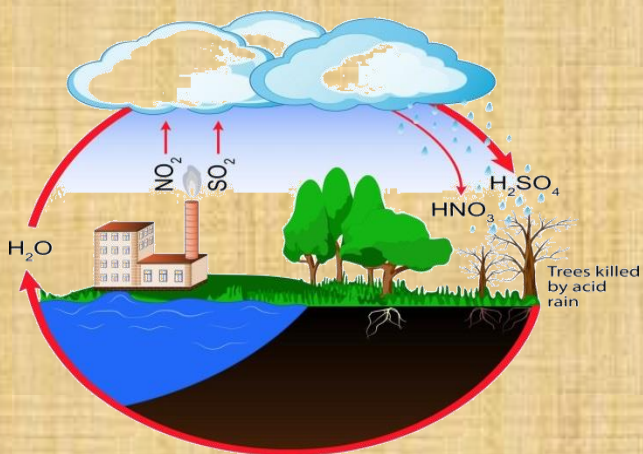
ACID RAIN:

Acid rain is an unusually acidic rain. It contains a higher level of acid than normal.

Acid rain is caused by the acidic gases like Sulphur dioxide, nitrogen dioxide and carbon dioxide, which are released into air as pollutants. These gases react with falling raindrops and forms sulphuric acid, nitric acid and carbonic acid. It makes the rainwater acidic.



ACID RAIN



Acid rain damages stone bridges and monuments made of stone like Taj Mahal. It also damages the aquatic life by making the water of lakes, rivers acidic.

Manures:

Manure is an excellent source of nutrients to support the growth of crops and makes the soil fertile. Manures are plant or animal wastes, used as sources of nutrients to plants.

The sources of Manures include cattle dung, sheep and goat manures, oil cakes, slaughterhouse wastes, crop wastes etc. These organic manures are cost effective and increase the water holding capacity of soil. These are good sources of all the required nutrients for plants and produces healthy crops. Methane gas evolved as the by-product of manure used for cooking purposes.



Salts:

Salts form when acid and base mixed in equal proportions. The process of acid and base neutralizing each other to form salt and water is neutralization.

For example, common salt is NaCl - Sodium chloride forms by the neutralization of hydrochloric acid and caustic soda. The salt formed depends on the type of acid and base combined. The salts may be acidic or basic. Acidic salts turn blue litmus to red. Basic salts change red litmus to blue.

Neutral salts form by the neutralization of strong acid and strong base. It does not change the color of litmus.

Neutral solutions are neither acidic nor basic like sugar solution.

