Synthetic and Natural Indicators

Introduction

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.

Indicators

An **indicator** is a 'dye' that changes color when it is put into an acid or a base. An indicator gives different colors in acid and base.

A substance which contains an acid is said to be **acidic** whereas the substance which contains a base is said to be **basic**. An indicator tells us whether the substance we are testing is acidic or basic by change in its color.

Two types of Acid-base indicators:

Natural Indicator: Indicators that are obtained from naturally occurring substance are called **Natural Indicators**. Example: litmus, turmeric, China rose, etc.

Synthetic Indicator: Indicators that are made in laboratory are called **Synthetic Indicators**. Example: phenolphthalein, methyl orange, etc.

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Synthetic Indicators:

1. Methyl Orange: It is orange in color.

- It turns dark red-orange in an acidic solution.
- It turns yellow basic or neutral solution.
- It turns yellow in a neutral or salt solution.

2. Phenolphthalein:

- It is a colorless solution.
- It turns pink in a basic solution.
- It does not change color in an acidic solution.

It does not change in a neutral and salt solution.

Natural Indicators:

1. Litmus: Litmus is extracted from Lichens. In the chapter on Nutrition in Plants, you have read that lichen is a composite organism. Lichens consist of fungi and algae living in symbiotic relationship.

- Litmus is a purple coloured liquid in distilled water.
- Litmus comes in the form of strips of two colors.
- One is called blue litmus paper and another is called red litmus paper.
- Litmus liquid and litmus paper are used to detect the acidic or basic nature of a substance.

Color of litmus paper in acid: Blue litmus paper turns into red when dipped in acidic solution.

Color of litmus paper in base: Red litmus paper turns into blue when dipped in basic solution.

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2. Turmeric: Turmeric is also used as natural indicator. Turmeric is of yellow color. Turmeric paper turns into red when it is dipped into basic solution. Turmeric paper does not change its color with acid.

3. China Rose: China rose is another natural indicator. China rose solution gives dark pink (magenta) color with acid and green color with base.