



ACIDS, BASES AND SALTS

• ACIDS

An Acid is a chemical substance that **has sour taste**. Acids are corrosive in nature and harmful to the skin. Some common acids are -

Name of Acid	Found in
Acetic Acid	Vinegar
Formic Acid	Ant's Sting
Citric Acid.	Oranges, lemons
Lactic Acid.	Curd
Oxalic Acid	Spinach, tomato
Ascorbic Acid(Vitamin C)	Amla,Citrus fruits
Tartaric acid	Tamarind,grapes,unripe mangoes, etc..

NOTE: Acids are either strong or weak. Strong acids like sulphuric acid can melt metals. These should be handled with care.

• BASES

A base is a chemical substance that has a **bitter taste and feel slippery in touch**. They are **corrosive and good conductors of electricity** as they allow the passage of electrons through them.

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

NATURAL INDICATORS AROUND US

There are some special substances that **are used to identify acidic and basic nature of a substance** are known as **Indicators**.

Some naturally occurring indicators are -

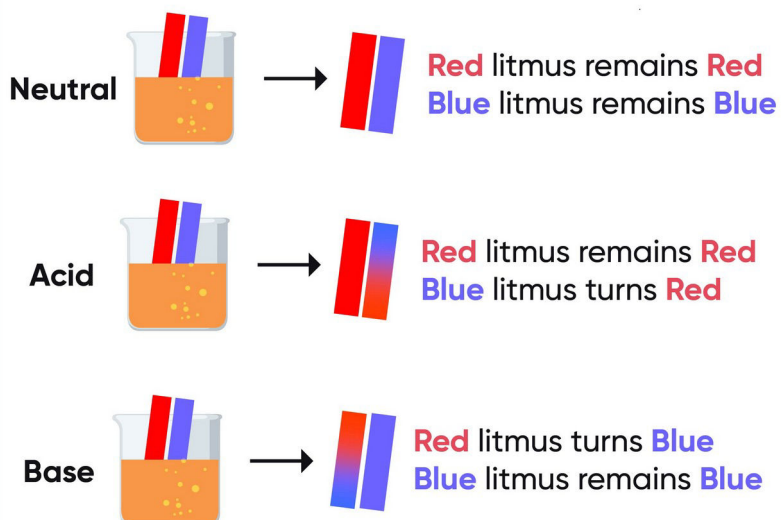
1. LITMUS – A NATURAL DYE

- ✕ The most commonly used natural indicator is litmus and is **obtained from Lichens**.
- ✕ Usually, it is available in the form of a solution or as red and blue litmus paper.
- ✕ Litmus have **mauve (purple) colour in distilled water**.
- ✕ When added to an **acidic solution**, it turns **red** and when it is added to **basic solution**, it turns **blue**.
- ✕ The solutions, which **do not change the colour** of either red or blue litmus paper are called **Neutral solution**.



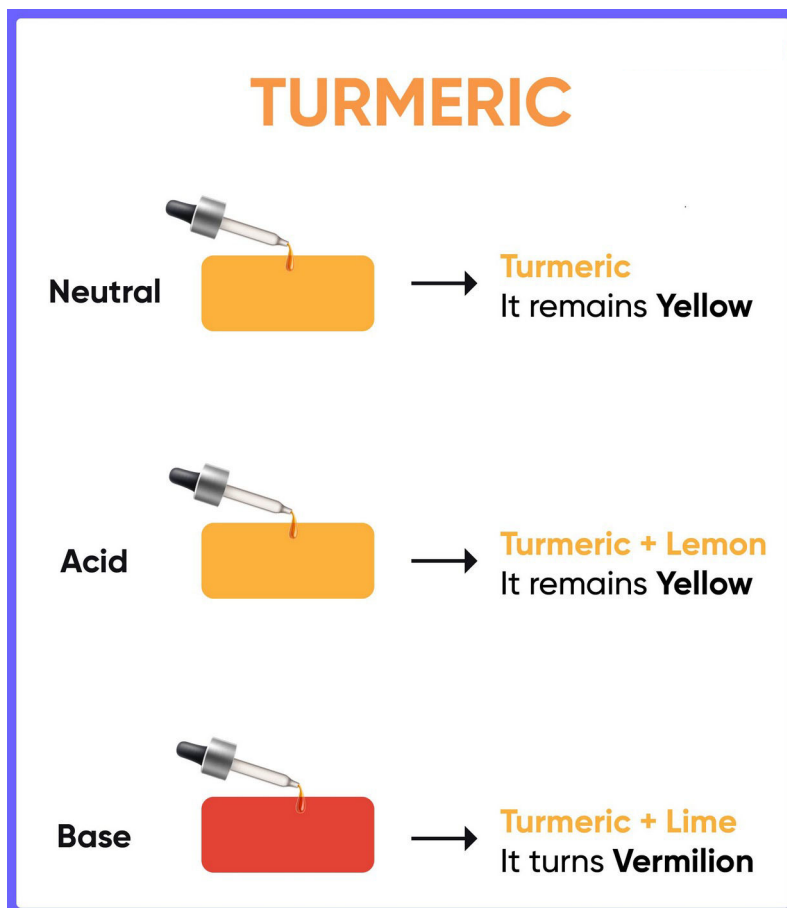
Lichen

NATURAL INDICATORS



2. TURMERIC

- x It is a **bright yellow powder** obtained from a plant. It is called '**Haldi**' in Hindi.
- x Turmeric is **yellow** in acidic and neutral medium while it changes its colour to **red** in basic medium.



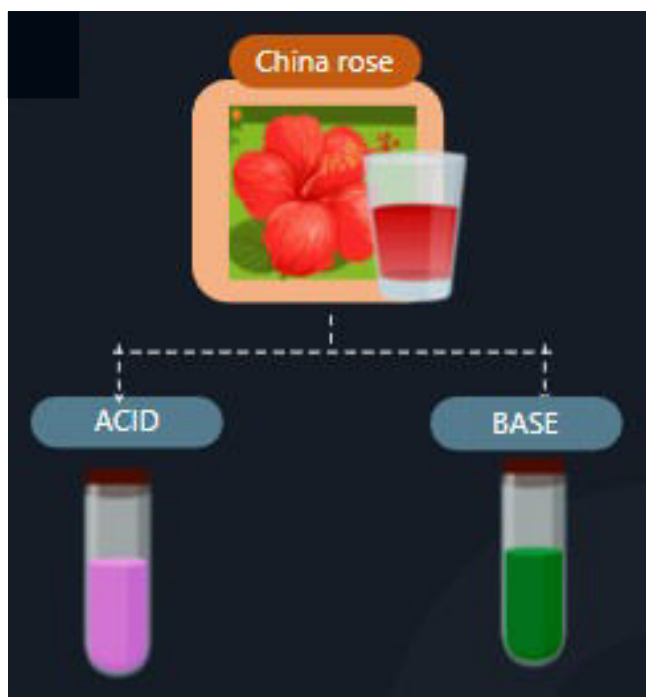
- x Example – Turmeric stain on clothes turn red when it is washed with soap. It is because soap is basic in nature.
- x It is used as indicator in the form of **turmeric paper**.

3. CHINA ROSE

- x It is a natural indicator that is extracted from the petals of China rose or '**Gudhal**'.
- x When the petals of this flower is added to water, a light pink solution is formed. This pink solution is used as an indicator, when added to another solution.

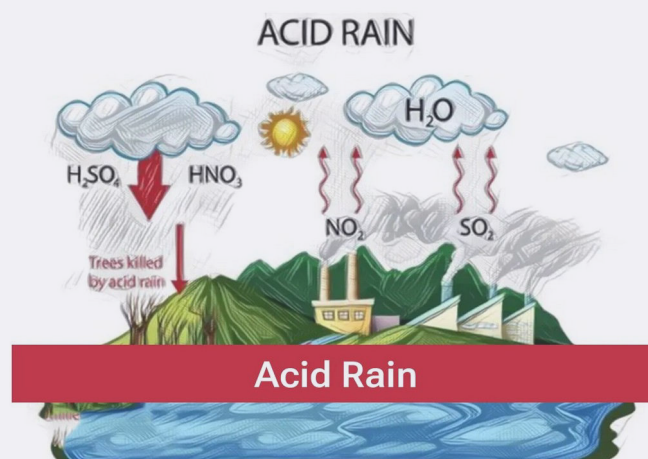


- ✗ If the colour of the solution changes to **deep pink (magenta)**. The solution is **acidic**.
- ✗ If the colour of the solution changes to **green**, the solution is **basic**.



ACID RAIN

Several oxides such as **carbon dioxide**, **sulphur dioxide**, **nitrogen dioxide** are released into air as pollutants. When these oxides mix with water, acids like nitric acid, sulphuric acid are formed. These acids then fall on Earth as acid rain. Acids are corrosive in nature. Hence, acid rain cause damage to buildings, historical monuments, plants and animals.



NEUTRALISATION

- x The reaction in which an **acid reacts with a base to form salt and water** along with evolution of heat is called **Neutralisation**.

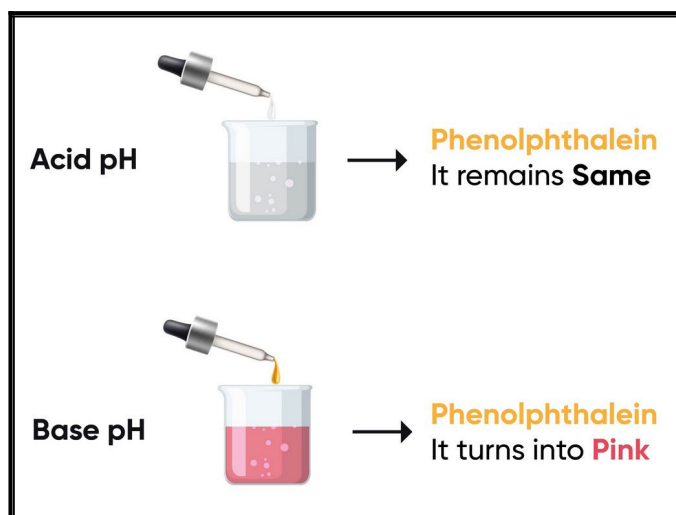
Example – When **Hydrochloric acid (HCl)** reacts with **sodium hydroxide (NaOH)** to form **sodium chloride (NaCl)** and **water (H₂O)**.
The sodium chloride is salt. The chemical reaction are as follows:



- x 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**.
- x In this process, both the acidic nature of acid and basic nature of base are destroyed.
- x The **solution formed is neutral**, but salt produced can be acidic, basic or neutral.
- x **Some heat is produced during the reaction**, which raises the temperature of mixture.

Phenolphthalein as an Indicator -

- x To know the nature of solution during the neutralization process, we use phenolphthalein as an indicator.
- x It is a **synthetic (non-natural) indicator**.
- x When the solution is **basic**, it gives **pink** colour, but if solution is **acidic**, phenolphthalein **remains colourless**.

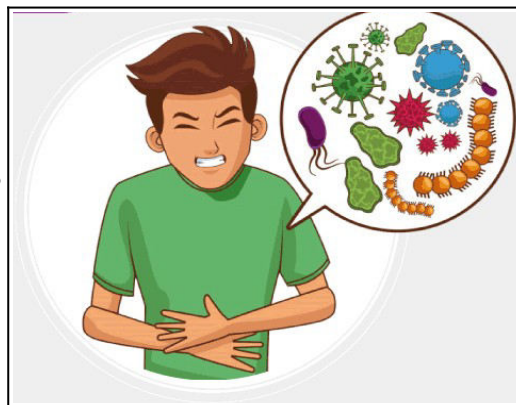


NEUTRALISATION IN EVERYDAY LIFE

The neutralisation reaction plays a very important role in our everyday life. Some of the examples that involves neutralisation reaction are as follows:

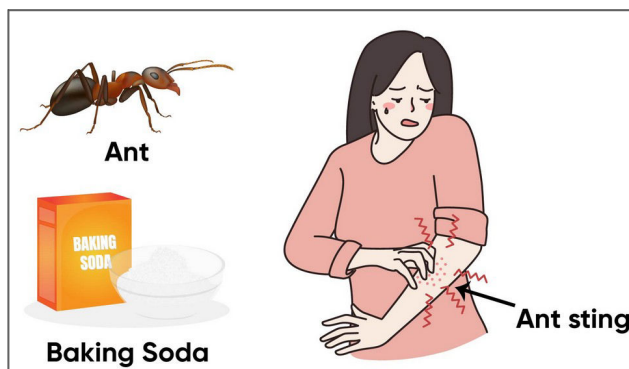
1. INDIGESTION

- ✗ Our stomach produces **Hydrochloric acid (HCl)** which helps in digesting the food present in it.
- ✗ Sometimes, **excess** of hydrochloric acid **causes indigestion**.
- ✗ It can **lead to pain and irritation in stomach**.
- ✗ To relieve indigestion, we take an **antacid which contains base**, example **Milk of Magnesia** has magnesium hydroxide.
- ✗ Milk of magnesium neutralizes the excess acid present in the stomach and cures indigestion.

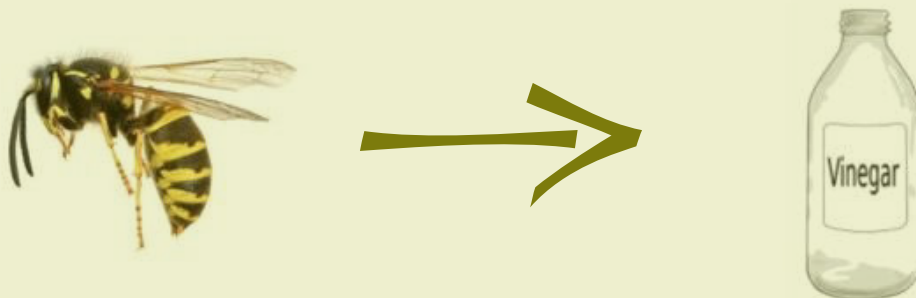


2. ANT BITES

- ✗ When an ant bites, it **injects an acidic liquid into the skin** of the person which **causes burning sensation**.
- ✗ The sting of an ant contains an acid called **Formic acid**.
- ✗ The effects of the acid **can be neutralised by rubbing a mild base**, example, **baking soda solution** (sodium hydrogen carbonate) or **calamine solution** which contain zinc carbonate.
- ✗ Thus, **being a base**, baking soda solution or calamine solution neutralises the acidic liquid injected by the ant and cancel the effects.

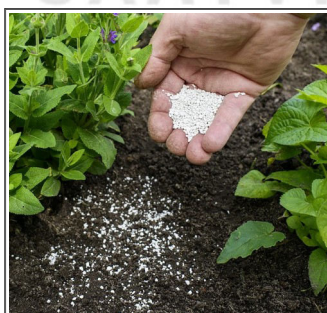


A bee sting is treated by rubbing **pickle** on the site. It is because **bee** contains a **base** called '**Melittin**'. It reacts with the **acetic acid** (**Vinegar**) in pickles and get neutralised.



3. SOIL TREATMENT

- ✗ The soil **may be acidic or basic naturally**.
- ✗ The plants do not grow well, if the soil at a place is too acidic or too basic.
- ✗ **Excessive use of chemical fertilizers makes the soil acidic.**
- ✗ When the **soil is too acidic**, it is treated with **bases** like **quicklime** (calcium oxide) or **slaked lime** (calcium hydroxide), The bases neutralise the excess acid present in the soil and reduce its acidic nature.



- ✗ If the **soil is basic**, organic matter called **manure** or **compost** are added to it. The **organic matter releases acids** which neutralises the basic nature of the soil.



4. FACTORY WASTE

- ✗ The waste substances discarded from the **factories contain acids**.
- ✗ If these factory wastes are allowed to flow into the water bodies then the acid present in them will **kill fish and other organisms**.
- ✗ The **factory wastes are therefore neutralised by adding basic substances** before discarding them into the water bodies.



GLOSSARY

- **Acids** – The substances which have sour taste are called Acids.
Example – lemon juice, orange
- **Bases** – The substances which have bitter taste and are soapy to touch are called bases
Example – quicklime etc.
- **Indicators** – These are special substances used to test whether the substance is acidic or basic in nature.
- **Neutralization** – The reaction in which an acid reacts with a base in suitable amount to form a salt and water is called neutralization reaction.
- **Neutral substance** – Those substances which do not bring any colour change with litmus paper are called neutral substances.
- **Salt** – It is compound which is formed by the neutralisation of an acid with a base.
- **Synthetic Indicators** – These are indicators which are made by human beings
Example – Phenolphthalein