Acid Base and Salt

Acids

Acidity is a characteristic property of acids. Acidic substances are usually very sour. Apart from hydrochloric acid, there are many other types of acids around us. Citrus fruits like lemons and oranges contain citric and ascorbic acids while tamarind paste contains tartaric acid.

In fact, the word ‘acid’ and ‘acidity’ are derived from the Latin word ‘acidus’ which means sour. If you dip a blue litmus paper into an acid, it will turn red while a red litmus paper will not change colour. Acids also liberate dihydrogen when they react with some metals.

Bases

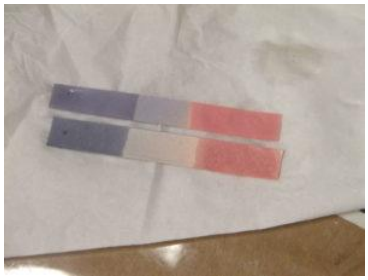
Bases turn red litmus paper blue while the blue litmus paper stays blue. They taste bitter and also feel soapy. Some other common examples of bases include sodium bicarbonate that is used in cooking and household bleach.

Salts

Apart from sodium chloride, other common salts are sodium nitrate, barium sulfate etc. Sodium chloride or common salt is a product of the reaction between the hydrochloric acid (acid) and sodium hydroxide (base). Solid sodium chloride is made of a cluster of positively charged sodium ions and negatively charged chloride ions held together by electrostatic forces.

Litmus

Litmus is a water-soluble mixture of different dyes extracted from lichens. It is often absorbed onto filter paper to produce one of the oldest forms of pH indicator, used to test materials for acidity. A *litmus test* is used to find out if a solution is an acid or a base. A special kind of paper is dipped in the liquid being tested during a *litmus test*.



Acid & Bases Characteristic

Acids

- Acids are corrosive in nature.
- They are good conductors of electricity.
- Their pH values are always less than 7.
- When reacted with metals, these substances produce hydrogen gas.
- Acids are sour-tasting substances.
- Examples: Sulfuric acid [H_2SO_4], Hydrochloric acid [HCl], Acetic acid [CH_3COOH].

Bases

Some properties, like a bitter taste, are owned by all bases. The bases feel slippery, too. Dream on what slippery soap looks like. And this is a foundation. Furthermore, when immersed in water, bases conduct electricity because they consist of charged particles in the solution.

- They are found to have a soapy texture when touched.
- These substances release hydroxide ions (OH^- ions) when dissolved in water.
- In their aqueous solutions, bases act as good conductors of electricity.
- The pH values corresponding to bases are always greater than 7.
- Bases are bitter-tasting substances which have the ability to turn red litmus paper blue.
- Examples: Sodium hydroxide [NaOH], milk of magnesia [$Mg(OH)_2$], calcium hydroxide [$Ca(OH)_2$].

Acid Types

There are two basic types of acids organic and inorganic acids. Inorganic acids are sometimes referred to as mineral acids. As a group, organic acids are generally not as strong as inorganic acids. The main difference between the two is the presence of carbon in the compound; inorganic acids do not contain carbon.

- **Inorganic acids** – Inorganic acids are often termed mineral acids. The anhydrous form may be gaseous or solid. An inorganic anhydride is an oxide of metalloid which can combine with water to form an inorganic acid.

Example:

1. Sulphuric acid (H_2SO_4)
2. Phosphoric acid (H_3PO_4)
3. Nitric acid (HNO_3)

- **Organic acids** – Organic acids are corrosive and toxic. Corrosivity is a form of toxicity to the tissues that the acid contacts. Organic acids and their derivatives cover a wide range of substances. They are used in nearly every type of chemical manufacture. Because of the variety in the chemical structure of the members of the organic acid group.

Example:

1. Acetic acid
2. Citric acid
3. Formic acid

Difference b/w Base & Alkali

Difference between Alkali and Base	
Base	**Alkali**
Bases do not dissolve in water	Bases that dissolve in water are alkali
All bases are not alkali	All alkali are bases
It neutralizes acids	It releases OH- ions, accepts a proton
Example: Zinc hydroxide, copper oxide	*Example:* potassium hydroxide, sodium hydroxide

Organic Acid

Organic acids are widely distributed in nature as they occur in animal, plant, and microbial sources. They contain one or more carboxylic acid groups, which may be covalently linked in groups such as amides, esters, and peptides. Production of organic acids on a large industrial scale is mainly confined to acids of microbial origin [6]. A number of organic acids of bacterial and fungal origin are important industrial products, the biological production of which has a definite economic advantage over chemical synthesis.

Ph Scale

pH is defined as the negative logarithm of H^+ ion concentration. Hence the meaning of the name pH is justified as the power of hydrogen.

A pH scale is a tool for measuring acids and bases. The scale ranges from 0-14: Litmus paper is an indicator used to tell if a substance is an acid or a base. The colour of the paper matches up with the numbers on the pH scale to indicate what kind of substance is being tested. For example, Vinegar is an acid and measures 2.4 on the pH scale.

A healthy pH balance plays a significant role in your overall well being, and doctors and scientists usually agree on this. The pH level, or possible level of hydrogen, in your body is determined by the food and type of drink you consume. The pH is the concentration of the hydrogen ions. This calculation is based on a 0 to 14 scale.

The pH scale is logarithmic and shows the solution's concentration of hydrogen ions inversely. This is because the formula used to measure pH approximates the molar concentration of hydrogen ions in the solution to the negative of the base 10 logarithms. More specifically, pH is the negative of the activity of the H+ ion from the base 10 logarithms.

The pH scale can be traced to a series of standard solutions whose pH is defined by international agreement. By calculating the potential difference between a hydrogen electrode and a standard electrode such as the silver chloride electrode, primary pH standard values are calculated using a concentration cell with transference.

A glass electrode and pH metre, or colour-changing indicator, may be used to measure the pH of aqueous solutions.