

Chapter – 4: Acids, Bases and Salts

- Daily life – lots of substances – tamarind, common salt, sugar, vinegar
- Taste – lemon juice, orange juice, vinegar, curd, tamarind (*imli*), sugar, common salt, *amla*, baking soda, grapes, unripe mango, cucumber
- Some taste sour – some taste bitter – some taste sweet – some taste salty

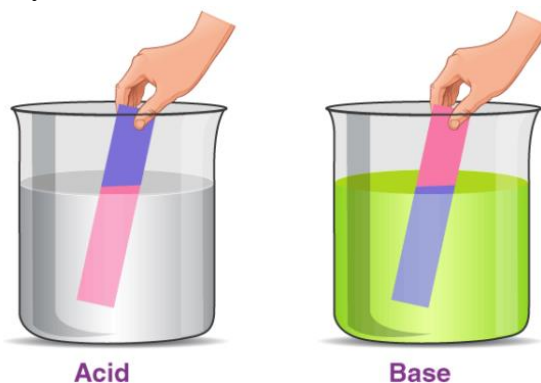
Acids and Bases

- Curd, lemon juice, vinegar – sour taste – **acidic nature** – **acids**
- Acid – Latin word *acere* – sour taste
- Baking soda – does not taste sour – no acids – bitter taste
- Rub between finger with water – feels soapy
- Substances – bitter taste – feel soapy – **basic nature** – **bases**
- Cannot taste everything – some harmful
- Special substances – test acidic or basic - **indicators**
- Indicators – change colour – according to solution's nature – acidic or basic
- Turmeric, litmus, China rose petals (*Gudhal*)

Natural Indicators around Us

Litmus: A natural dye

- Most commonly used
- Extracted from **lichens**
- Mauve (purple) colour in water
- Add to acidic solution – turns red – add to basic solution – turn blue
- Available – solution or strip of paper forms
- Strip of paper –
 - Blue –
 - Turns red in acid and no change in base
 - Red –
 - Turns blue in base and no change in acid
- Solutions – do not affect any colour – **neutral**



Turmeric is another natural indicator

- Paste of turmeric powder – deposit on filter paper – apply soap solution – basic – changes colour

China rose as indicator

- Deep petals in warm water – keep them till water is coloured
- Add solutions to it and test them
- Acidic – water turns to dark pink (magenta)
- Basic – water turns to green
- Neutral – water keeps its colour

Neutralisation

- What happens when acid mix with base?
- We will use indicator – **phenolphthalein**
- Take a test tube – fill with dilute hydrochloric acid – note the colour – add indicator – shake well – now add base – note the permanent change in colour
- Acidic solution – phenolphthalein remain colourless
- Basic solution – phenolphthalein changes colour to pink
- Acidic mixed with basic – neutralize (cancel out) each other's effect
- New solution – neither acidic nor basic
- Test tube – gets heated – heat produced during neutralization – raises temperature
- Reaction between acid and base is neutralization – salt and water produced as result along with heat
 - Acid + Base \rightarrow Salt + Water + heat evolved
 - Hydrochloric acid (HCl) + Sodium hydroxide (NaOH) \rightarrow Sodium chloride (NaCl) + Water (H₂O)

Neutralization in Everyday Life**Indigestion**

- Stomach contain hydrochloric acid
- Helps in digestion
- Too much acid – indigestion
- Relieve indigestion – antacid – milk of magnesia – magnesium hydroxide – neutralizes the effect

Ant bite

- Ant bite – inject acidic liquid (formic acid) into skin
- Neutralize – rubbing moist baking soda (sodium hydrogencarbonate) or calamine solution (zinc carbonate)

Soil treatment

- Excessive use – chemical fertilizers – soil become acidic
- Plants – do not grow well – soil – too acidic or too basic
- Acidic soil – add bases – quick lime (calcium oxide) or slaked lime (calcium hydroxide)
- Basic soil – add organic matter (compost) – release acid

Factory wastes

- Contain acid
- Released into water – kills aquatic organisms
- Treat with bases before releasing to water bodies