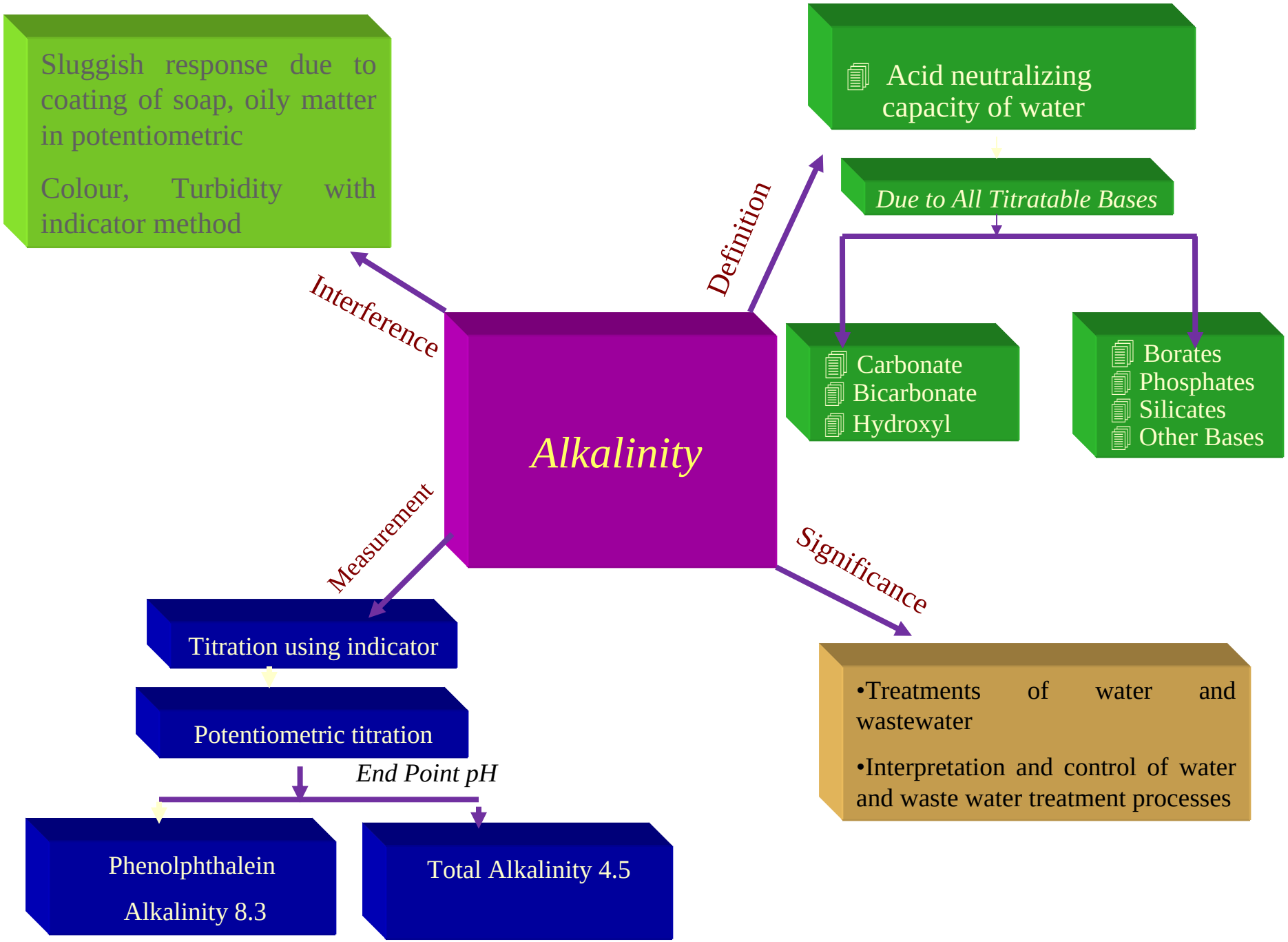
Children with safe water

Thank You


Alkalinity
Definition
Acid neutralizing capacity of water
Due to All Titratable Bases
Carbonate
Bicarbonate
Hydroxyl
Borates
Phosphates
Silicates
Other Bases
Interference
Sluggish response due to coating of soap, oily matter in potentiometric
Colour, Turbidity with indicator method
Measurement
Titration using indicator
Potentiometric titration
End Point pH
Phenolphthalein Alkalinity 8.3
Total Alkalinity 4.5
Significance
•Treatments of water and wastewater
•Interpretation and control of water and waste water treatment processes

Turbidity

General

- Turbidity in water is caused by suspended matter such as

  Clay

  Silt

  Finely divided organic and inorganic matter

  Soluble coloured organic compounds

  Plankton and other microscopic organisms

Definition

- Turbidity is an expression of the optical property that causes light to be scattered and absorbed
- It is not possible to correlate turbidity with the weight concentration of suspended matter because light scattering properties of the suspended particulate matter depends upon size, shape and refractive index of the particulates

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Significance

- Clarity of water is important for human consumption
- Manufacturing processes such as beverages, and many food products need clear water

Unit for Turbidity Measurement

- Previously standard method for measurement of turbidity was based on the Jackson Cnadle turbidimeter
- The lowest turbidity value that can be measured by this instrument is 25 J.T.U.
- Need was felt to measure turbidity values even less than one unit because turbidities of treated water usually fall within the range of 0 to 1 unit
- Different types of secondary instruments were developed to measure turbidity values in low range

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- The results obtained with different types of secondary instruments frequently do not match closely with one another, even though the instruments are precalibrated against Jackson Candle turbidimeter, because of fundamental differences in optical systems
- Nephelometers developed for measuring low turbidities give comparatively good indications of the intensity of light scattered at right angles to the incident light, and are specified as the standard instrument for measurement of low turbidities
- The prescribed for turbidity measurement by Nephelometer is Nephelometric Turbidity Units (N.T.U.)
- Formazin polymer is used as the reference turbidity standard suspension
- Because there is no direct relationship between the intensity of light scattered at 90^{O} angle and Jackson candle turbidity there is no basis for the practice of calibrating a Nephelometer in terms of candle units
- However specific concentration of formazin polymer suspension defined as 40 NTU turbidity has an approximate turbidity of 40 JTU

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Method

Nephelometric

- Nephelometric method of turbidity measurement is based in a comparison of the intensity of light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions
- Higher the intensity of scattered light the higher the turbidity
- Turbidimeter with a tungston filament lamp as a light source for illuminating the sample and a photoelectric detector with a read out device is a system used for turbidity measurement by turbidimeter
- Meter is designed to prohibit stray light reaching to detector
- Short warm period is necessary to make the instrument free from significant drift
- Clear colourless glass tube is used for sample

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Hardness

Definition

- Total Hardness is defined as the sum of the calcium and magnesium concentrations, both expressed as calcium carbonate, in mg/L
- Originally water hardness was under stood to be a measure of the capacity of eater to precipitated soap
- Soap is precipitated chiefly by calcium and magnesium ions present. Other prevalent cations also precipitate soap but they often are in complex forms and minimal concentration

Significance

- Scale formation in boilers, pipes and cooking utensils
- Adverse effect on domestic use
- Encrustation in water supply structure
- Cathartic and diuretic effect

Contd...

Type

- Carbonate hardness
- Non carbonate hardness

Methods of Analysis

Hardness by calculation

- Calcium can be estimated by AAS, ICP and EDTA titrimetric methods
- Magnesium can be estimated by AAS, ICP and Gravimatric method

Total Hardness by Calculation :

mg $CaCO_3$ / L = 2.497 [Ca mg/L] + 4.118 [Mg mg/L]

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