



**SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES**

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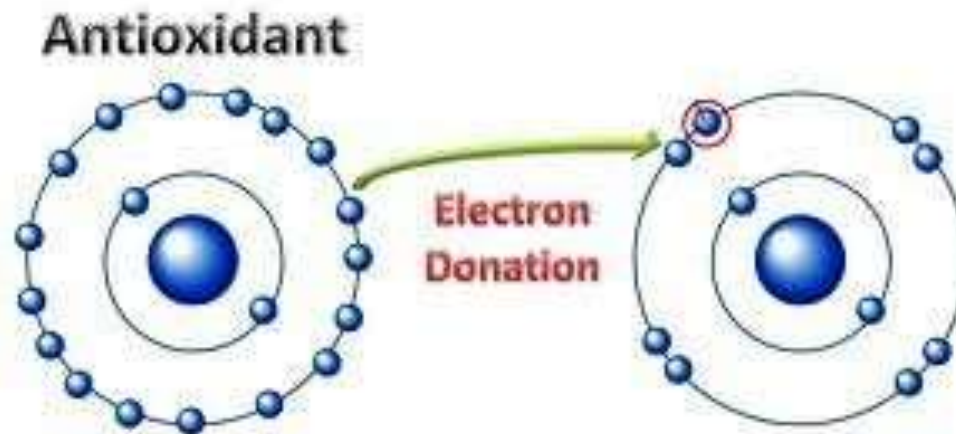


# Antioxidant

# Definition :

**“The agent which used to prevent oxidation is known as antioxidants.”**

**Eg: Nitrogen**



- HYPOPHOSPHORUS ACID
- SODIUM METABISULPHITE
- SODIUM THIOSULPHITE
- NITROGEN
- SULPHUR DIOXIDE
- SODIUM BISULPHITE
- SODIUM NITRITE

# Hypophosphorus Acid



MOP:-

By reacting calcium hypophosphite with acid like sulphuric acid



# Properties :-

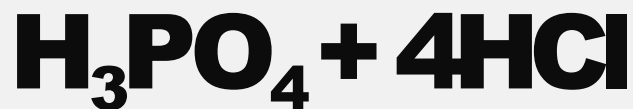
## a) Physical Properties:

- **Colorless or slightly yellow colored liquid**
- **Odorless**
- **Miscible with water**
- **Miscible with alcohol**
- **Miscible with ether**
- **Aqueous solution is strongly alkaline in nature**

## b) Chemical Properties:-

i) When it reacts with chlorine it gives

hydrochloric acid



ii) It reduces iodine to iodide

# Uses:

- **Antioxidant**
- **For Preparation of ferrous iodide syrup**
- **Preservative**
- **Reducing agent**
- **Nutrient formulation**
- **Nerve tonic** (strengthens & restores nerve tissue)

## Storage

“ It should be stored in well closed container at a cool Place.”

## Incompatibility

- Strong oxidizing agent like nitrate, permanganate
- mercury, silver, lead salts etc



# Sodium Metabisulphite

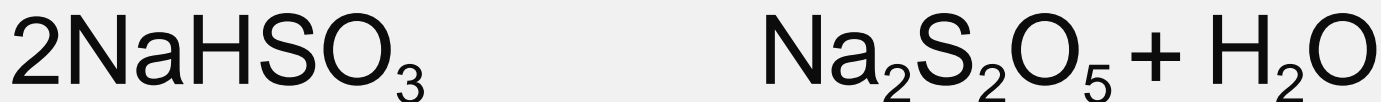
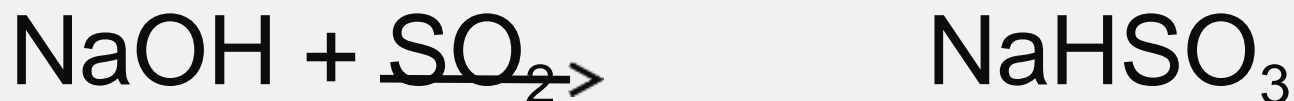


Syn: **Disodium pyrosulphite,  
sodium pyrosulphite**

## MOP:-

By passing sulphur dioxide gas through a hot solution of sodium hydroxide it gives sodium bisulphite it

form sodium metabisulphite  
→



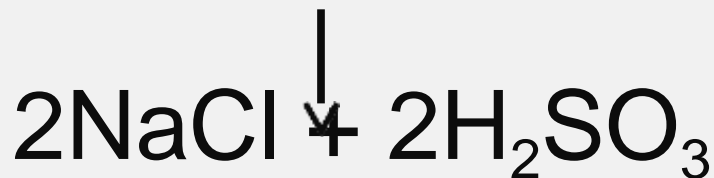
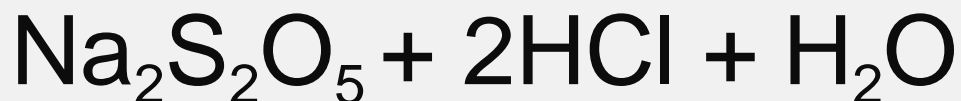
# Properties :-

## a) Physical Properties:

- White Crystalline powder
- Odour of sulphur dioxide
- Acidic taste
- Freely soluble in water
- soluble in glycerol
- Slight soluble in alcohol
- Aqueous solution is strongly acidic in nature

## **b) Chemical Properties:-**

i) When it reacts with hydrochloric acid gives sodium chloride & sulphurous acid



ii) When exposed to moisture it is slowly converted into sulphate

# Uses:

- **Antioxidant**
- **Various pharmaceutical preparation**
- **Stabilize injections**
- **Used as Preservative**
- **Antimicrobial agent**

## Storage

“ It should be stored in well closed container at a cool Place.”

## Incompatibility

- sodium nitrite
- metal salts

# Sodium thiosulphite

**$\text{Na}_2\text{S}_2\text{O}_3$  / 248.18**

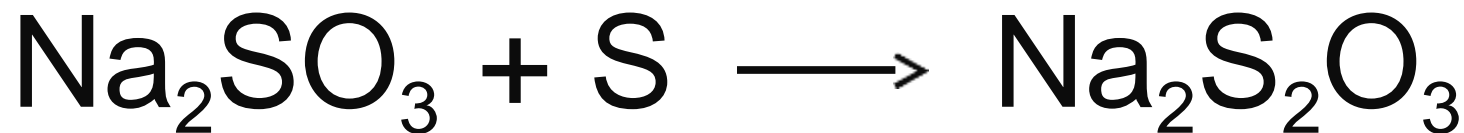
Syn: **sodium hyposulphite,**

**Natrii thiosulfas,**

**Antichlor**

## MOP:-

Boiling sodium sulphite with  
sulphur





# Properties :-

## a) Physical Properties:

- Colorless Crystalline powder
- Odorless
- Alkaline taste
- Very soluble in water
- Insoluble alcohol
- Deliquescent in nature

## b) Chemical Properties :-

i) When react with hydrochloric acid  
It gives precipitation of sulphur.



ii) It reduces the iodine to iodide

## Uses:

- Antioxidant
- In preparation of potassium iodide

## Solution

- Reducing agent
- Used in bleaching operations
- Fixer in photographic work
- As a antidote cyanide poisoning
- Antifungal agent

## Storage

“ It should be stored in well closed container at a cool Place.”

## Incompatibility

-metal cations

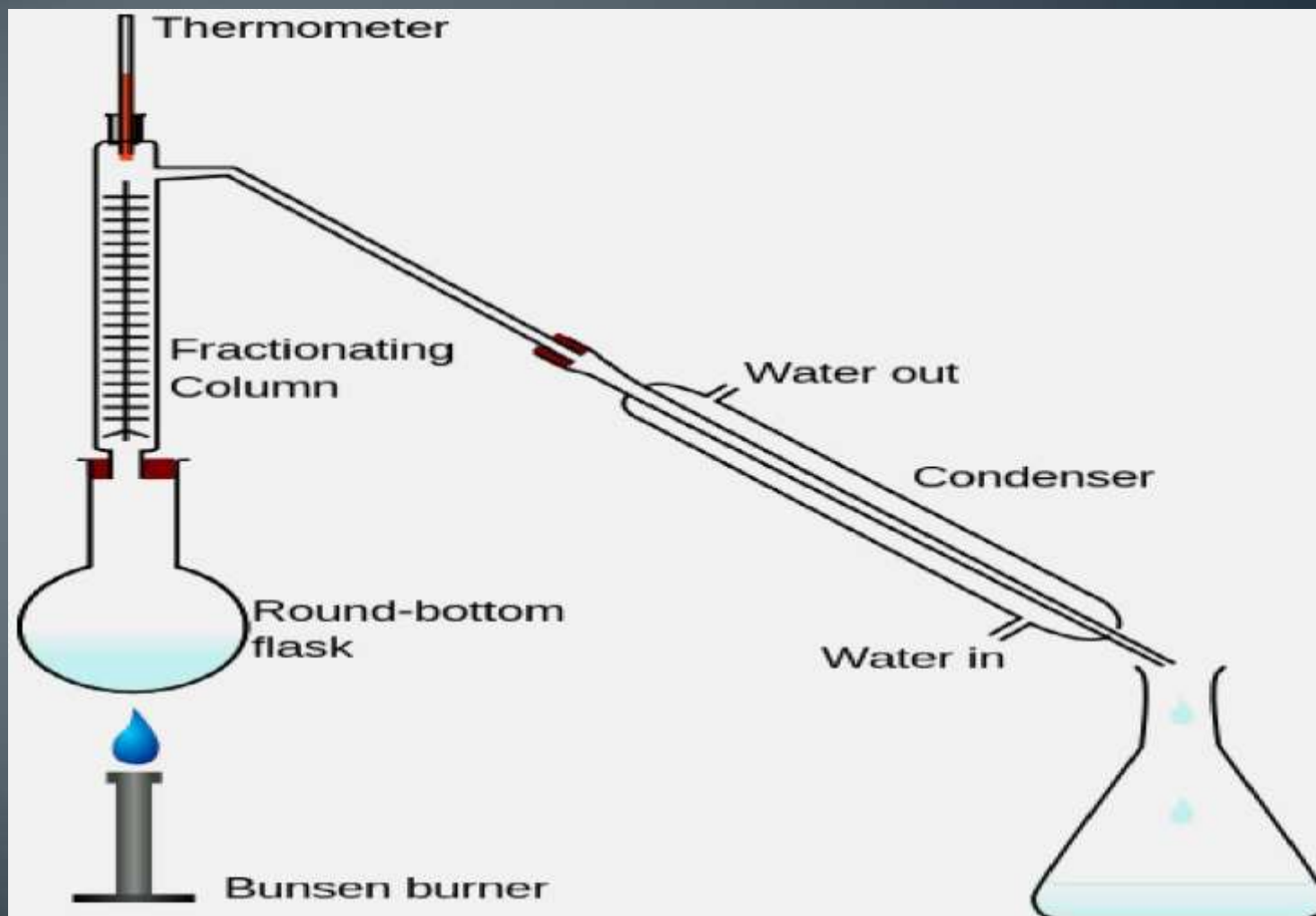
# Nitrogen



MOP:-

**It is prepared by fractional distillation of liquid air**

# Fractional Distillation



# Properties :-

## a) Physical Properties:

- Colorless gas
- Odorless
- tasteless
- Dissolve in water
- Less dissolve in alcohol
- Inert in nature
- Non inflammable gas

## **b) Chemical Properties :-**

- i) It is directly combine with metals and form nitrides at high temperature.
- ii) Not support combustion.



# Uses:

- Antioxidant
- for replacement of air in container of Parenterals
- Reagent in pharmaceutical preparation
- Manufacturing of ammonia, nitric acid
- Preservation of materials
- Liquid nitrogen used as a coolant in freezing process

## Storage

“ It should be stored in metal cylinder painted gray on neck and black on body, painted name “nitrogen” on cylinder.”

# Sulphur dioxide

**SO<sub>2</sub>/ 64.06**

MOP:-

**By burning sulphur in air or  
in oxygen**



# Properties :-

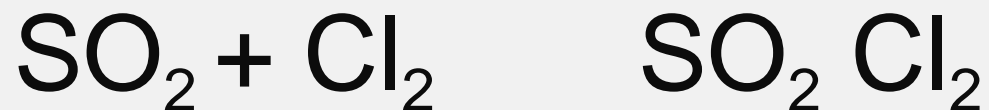
## a) Physical Properties:

- Colorless gas
- Pungent or irritating Odor
- tasteless
- Dissolve in water
- Dissolve in alcohol
- Acidic in nature
- Non inflammable gas

## b) Chemical Properties :-

i) When react with chlorine it gives

sulphonyl chloride.



ii) It reduces the iodine to iodide.

## Uses:

- Antioxidant
- For manufacturing of sulphuric acid
- Remove color from in sugar industry
- Preparation of Soft drinks
- Manufacturing of injections
- Fumigate houses

## Storage

“ It should be stored in well closed cylinder at a cool Place.”

## Incompatibility

- Strong oxidizing agent
- Neutral & alkaline P<sup>H</sup>

# Sodium Bisulphite

**NaHSO<sub>3</sub> / 104.06**

MOP:-

**By passing sulphur dioxide in to  
Solution of Sodium carbonate**





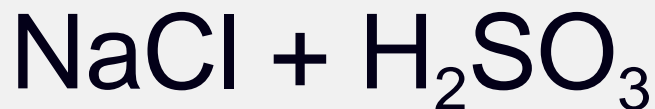
# Properties :-

## a) Physical Properties:

- White Crystalline powder
- Odor of sulphur dioxide
- Freely soluble in water
- Slightly soluble alcohol
- Unstable in presence of air

## b) Chemical Properties :-

React with hydrochloric acid it gives sodium chloride and sulphurous acid



## Uses:

- Antioxidant
- As a reducing agent
- Removal of permanganate stain
- Manufacturing of injections
- Antiseptics

# Storage

“ It should be stored in well closed container at a cool Place.”

# Common Properties

Hypo. Acid, Sod. Metabisulphite, Sod. Bisulphite, Nitrogen,  
Sulphur Dioxide, Sod. Nitrite, Sod. Thiosulphate

- **White color or Colorless**  
**(all powder except: nitrogen - sulphur dioxide are gas & hypophosphorus acid is liquid)**
- **Characteristic odor**
- **Miscible/ Soluble/ dissolve in water**
- **Soluble in alcohol (except Sodium thiosulphate)**

**Uses**

**As a Antioxidant**

**Incompatibilities**

**With oxidizing agent**