

WELCOME  
TO



Pharmacy

Learn and Educate



## Bachelor of Pharmacy Human Anatomy and Physiology I

### NOTES

- ✓ Unit 1
  - ✓ Unit 2
  - ✓ Unit 3
  - ✓ Unit 4
  - ✓ Unit 5
- All Unit  
in  
One PDF**

Visit our Website

[WWW.fdpharmacy.in](http://WWW.fdpharmacy.in)



## Bachelor of Pharmacy Pharmaceutical Analysis I

### NOTES

- ✓ Unit 1
  - ✓ Unit 2
  - ✓ Unit 3
  - ✓ Unit 4
  - ✓ Unit 5
- All Unit  
in  
One PDF**

Visit our Website

[WWW.fdpharmacy.in](http://WWW.fdpharmacy.in)



## Bachelor of Pharmacy Pharmaceutics I

### NOTES

- ✓ Unit 1
  - ✓ Unit 2
  - ✓ Unit 3
  - ✓ Unit 4
  - ✓ Unit 5
- All Unit  
in  
One PDF**

Visit our Website

[WWW.fdpharmacy.in](http://WWW.fdpharmacy.in)



## Bachelor of Pharmacy Pharmaceutical Inorganic Chemistry

### NOTES

- ✓ Unit 1
  - ✓ Unit 2
  - ✓ Unit 3
  - ✓ Unit 4
  - ✓ Unit 5
- All Unit  
in  
One PDF**

Visit our Website

[WWW.fdpharmacy.in](http://WWW.fdpharmacy.in)



## Bachelor of Pharmacy Communication skills

### NOTES

- ✓ Unit 1
  - ✓ Unit 2
  - ✓ Unit 3
  - ✓ Unit 4
  - ✓ Unit 5
- All Unit  
in  
One PDF**

Visit our Website

[WWW.fdpharmacy.in](http://WWW.fdpharmacy.in)



## Bachelor of Pharmacy Remedial Biology

### NOTES

- ✓ Unit 1
  - ✓ Unit 2
  - ✓ Unit 3
  - ✓ Unit 4
  - ✓ Unit 5
- All Unit  
in  
One PDF**

Visit our Website

[WWW.fdpharmacy.in](http://WWW.fdpharmacy.in)





# FD Pharmacy

.....

## D.Pharma B.Pharma



- 👉 PDF Notes
- 👉 Practical Manual
- 👉 Important Questions
- 👉 Assignment etc

 Download Now



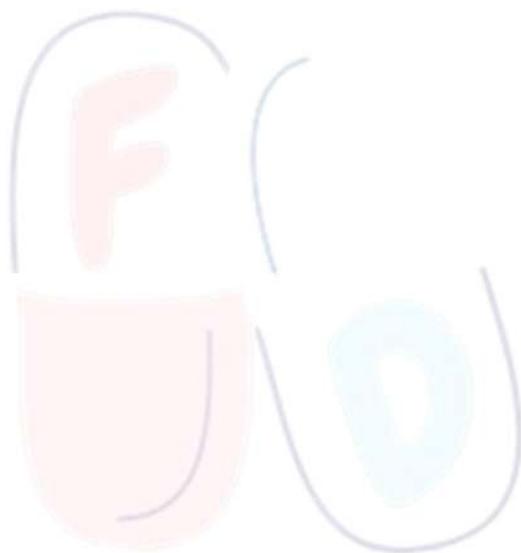
[www.fdp pharmacy.in](http://www.fdp pharmacy.in)

# PHARMACEUTICAL INORGANIC CHEMISTRY

## UNIT 4

TOPIC :

- **Miscellaneous compounds**
- **Expectorants : Potassium iodide, Ammonium chloride\***



# Pharmacy

Learn and Educate

## EXPECTORANTS

- Expectorants are the drugs that help in the removal of sputum (mucus) from the respiratory tract.
- They are commonly used in the treatment of cough, especially when the cough is productive (accompanied by mucus).
- Cough is a protective reflex that helps to clear the respiratory passages of mucus, irritants, or foreign substances.
- Types of Cough :

- **Dry Cough** – No mucus or sputum is produced
- **Productive Cough** – Mucus or sputum is discharged

### Classification of Expectorants

Expectorants act through two main mechanisms:

- By increasing fluidity of mucus (reducing viscosity)
- By increasing the volume of secretions

Based on these mechanisms, expectorants are classified into:

#### 1. Sedative Expectorants

- Also called stomach irritant expectorants
- They act by irritating the gastric mucosa, which in turn stimulates vagal reflexes, increasing the secretion in the respiratory tract.
- They increase the volume of sputum, making it easier to expel.
- May cause mild sedation in patients.

#### Examples :

- Ammonium chloride
- Potassium iodide
- Sodium citrate
- Ipecacuanha

## 2. Stimulant Expectorants

- These act directly or indirectly on the secretory cells of the respiratory tract.
- They stimulate mucus production, making sputum more watery and less sticky.
- They help in reducing the viscosity (thickness) of sputum → making it easier to cough out.

### Examples :

- Guaifenesin
- Terpin hydrate
- Vasaka (*Adhatoda vasica*)
- Bromhexine
- Ambroxol

## Uses of Expectorants

- ✓ To relieve productive cough
- ✓ In conditions like bronchitis, asthma, common cold, respiratory tract infections
- ✓ To clear mucus from bronchi and lungs
- ✓ Helps in better breathing and reduced chest congestion

Learn and Educate

## POTASSIUM IODIDE

- Chemical Formula: KI
- Molecular Weight: 166 g/mol
- Synonym: Kalii Iodidum

### Method of Preparation

Potassium iodide is prepared by reacting hydrogen iodide (HI) with potassium bicarbonate (KHCO<sub>3</sub>):



### Physical Properties

- Appears as colourless transparent crystals or white granular powder
- Odourless
- Has a bitter taste
- Hygroscopic in nature (absorbs moisture from air)
- Soluble in water and also soluble in alcohol

### Chemical Properties

- Stable in dry air but may turn yellow in moist air due to liberation of free iodine
- Acts as a source of iodide ion (I<sup>-</sup>)
- Can react with oxidizing agents to release elemental iodine (I<sub>2</sub>)

### Uses

- ✓ Expectorant  
→ Used in the treatment of chronic bronchitis and productive cough by stimulating the secretion of mucus in the respiratory tract.
- ✓ Antifungal agent  
→ Used in the treatment of fungal infections such as sporotrichosis.
- ✓ Iodine supplement  
→ Used for preventing and treating iodine deficiency and goiter.
- ✓ Saline diuretic  
→ Promotes urine production by altering electrolyte balance.
- ✓ Used in the preparation of iodine solutions like Lugol's iodine.

## AMMONIUM CHLORIDE

- Chemical Formula:  $\text{NH}_4\text{Cl}$
- Molecular Weight: 53.49 g/mol
- Synonym: Sal Ammoniac

### Method of Preparation

Ammonium chloride is prepared by the neutralization reaction between ammonia ( $\text{NH}_3$ ) and hydrochloric acid (HCl):



### Physical Properties

- Appears as a white crystalline powder
- Odourless
- Has a cooling, saline taste
- Highly soluble in water
- Slightly soluble in alcohol
- Hygroscopic (absorbs moisture from air)

### Chemical Properties

- On heating, it sublimes (converts directly from solid to gas)
- Slightly acidic in aqueous solution
- Compatible with many drugs and salts

### Uses

- ✓ Expectorant  
→ Used in cough syrups to promote removal of mucus by increasing bronchial secretions.
- ✓ Diuretic (Saline diuretic)  
→ Helps in promoting urine output in some cases.
- ✓ Acidifier  
→ Used to acidify urine in urinary tract infections and to treat alkalosis.
- ✓ Used in buffer solutions  
→ Especially in acid-base balance systems.
- ✓ Used in fertilizers and in textile printing and metalwork industries