# WELCOME

# TO


This is an Education Platform

We Provide PDF Notes for Pharmacy Students

Web Site http://www.fdspharmacy.in/

You tube https://www.youtube.com/c/FDSpharmacy

Telegram https://t.me/Fdspharmacy

App https://play.google.com/store/apps/details?id=com.FDSPharmacyMedia.FDSPharmacy

E-mail fdspharmacyinfo@gmail.com

# PHARMACEUTICAL ORGANIC CHEMISTRY - II

## UNIT 1

TOPIC :

- **Benzeneand its derivatives**

  Analytical, synthetic and other evidences in the derivation of structure

  of benzene, Orbital picture, resonance in benzene, aromatic characters, Huckel's rule
- Reactions of benzene- nitration, sulphonation, halogenation reactivity, Friedelcrafts alkylation reactivity, limitations, Friedelcrafts acylation.
- Substituents, effect of substituents on reactivity and orientation of mono substituted benzene compounds towards electrophilic substitution reaction
- Structure and uses of DDT, Saccharin, BHC and Chloramine

# Benzene Derivatives

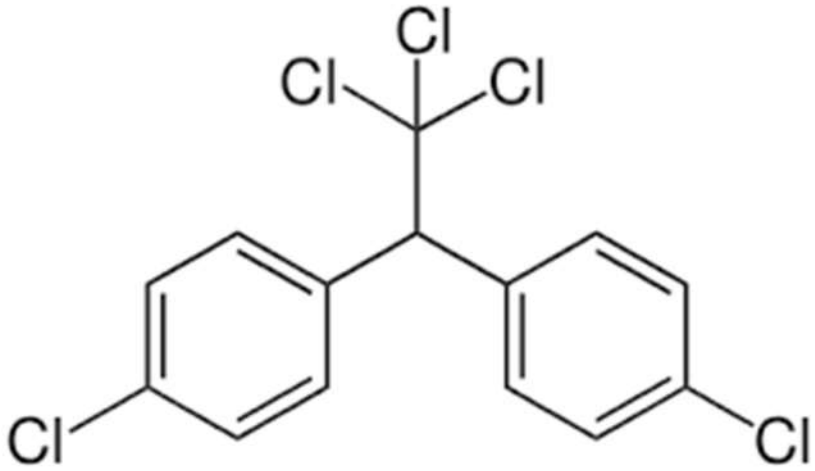
- When one or more hydrogen atoms of benzene are replaced by functional groups, the resulting compounds are called benzene derivatives.
- These derivatives retain the aromatic ring and exhibit distinct chemical and pharmaceutical properties.
- Below are four important benzene derivatives with their structure and uses:

## DDT (Dichlorodiphenyltrichloroethane)

**Structure:**

**Chemical formula**: $C_{14}H_9Cl_5$

- DDT is a chlorinated aromatic hydrocarbon.
- It consists of two chlorophenyl rings and a central trichloroethane group.




**Uses:**

- Powerful insecticide: Used against mosquitoes, lice, and crop pests.
- Malaria and typhus control: Widely used in public health.

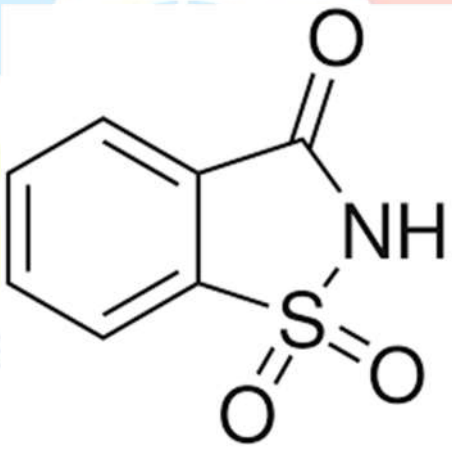
- Banned or restricted in many countries due to environmental persistence and bioaccumulation.
- Still used in some developing countries under WHO guidelines for malaria control.

## Saccharin (o-Benzosulfimide)

**Structure:**

**Chemical formula**: $C_7H_5NO_3S$

- Saccharin is a benzisothiazole ring with a sulfonyl group and an imide group.
- It is a heterocyclic compound.




**Uses:**

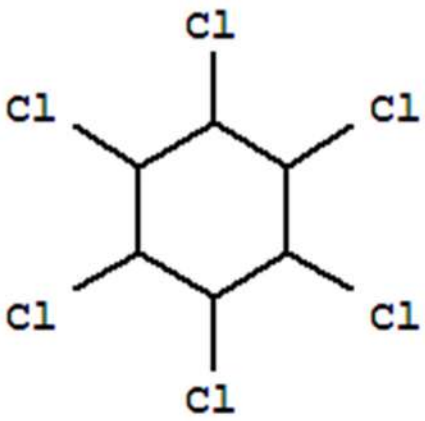
- Artificial sweetener: About 300–500 times sweeter than sucrose.
- Used in sugar-free products like:
  - Diabetic foods
  - Chewing gums
  - Toothpastes
- Non-caloric; not metabolized by the body.
- Often combined with other sweeteners to enhance taste.

# BHC (Benzene Hexachloride) or Lindane

**Structure:**

**Chemical formula** : $C_6H_6Cl_6$

- BHC is an organochlorine compound, obtained by chlorinating benzene in the presence of sunlight or UV light.
- Consists of a hexachlorinated cyclohexane ring.
- Multiple isomers are formed; the γ-isomer is called Lindane, which is biologically active.




**Uses:**

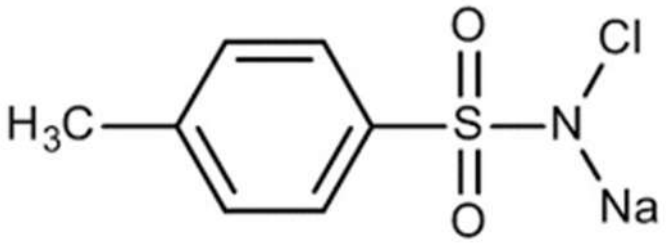
- Insecticide: Effective against lice, ticks, fleas, and termites.
- Used in agriculture to treat seeds, soils, and crops.
- Medicinal use: Topical treatment for scabies and head lice (limited due to toxicity concerns).
- Banned or restricted in many countries due to toxicity and environmental impact.

# Chloramine (Chloramine-T)

**Structure:**

**Chemical name**: Sodium *p*-toluenesulfonchloramide
**Chemical formula**: $C_7H_7ClNO_2SNa$

- Contains a benzene ring substituted with:
  - Methyl group ($-CH_3$)
  - Sulfonyl group ($-SO_3Na$)
  - Chloramine group ($-NCl$)




**Uses:**

- Disinfectant and antiseptic : Used in hospitals and laboratories.
- Used for sterilization of surgical instruments, skin antiseptic.
- Employed in water purification (kills bacteria and viruses).
- Also used in iodination reactions in organic chemistry (oxidizing agent).