

UNIT – 4

1. Forskolin:

- Industrial Production:

- **Source:** Forskolin is extracted from the roots of the plant *Coleus forskohlii*.
- **Cultivation:** The plant is cultivated on a large scale to meet industrial demand.
- **Extraction:** Forskolin is extracted from the roots using organic solvents.

- Estimation:

- **HPLC (High-Performance Liquid Chromatography):** Used for accurate quantification of forskolin.
- **Spectrophotometry:** UV-visible spectroscopy can be employed for estimation.

- Utilization:

- **Medicine:** Forskolin is used in traditional medicine for various purposes, including cardiovascular and respiratory conditions.
- **Weight Loss Supplements:** Marketed as a natural weight loss supplement.

2. Sennoside:

- Industrial Production:

- **Source:** Sennosides are derived from the leaves of *Senna* species (*Senna alexandrina*).
- **Cultivation:** Large-scale cultivation of *Senna* plants.
- **Extraction:** Leaves are harvested, dried, and sennosides are extracted using solvents.

- Estimation:

- **TLC (Thin-Layer Chromatography):** Used for qualitative analysis of sennosides.
- **HPLC:** Employed for quantitative estimation.

- Utilization:

- **Laxative:** Sennosides are widely used in the pharmaceutical industry as natural laxatives.

3. Artemisinin:

- Industrial Production:

- **Source:** Artemisinin is extracted from the leaves of *Artemisia annua* (Sweet wormwood).
- **Cultivation:** Large-scale cultivation of *Artemisia annua*.
- **Extraction:** Leaves are harvested, and artemisinin is extracted using solvents.

- Estimation:

- **HPLC:** Quantitative determination of artemisinin content.
- **Mass Spectrometry:** Confirmatory technique for structural elucidation.

- Utilization:

- **Antimalarial Drug:** Artemisinin is the precursor for the production of artemisinin-based combination therapies (ACTs), potent antimalarial drugs.

4. Diosgenin:

- Industrial Production:

- **Source:** Diosgenin is extracted from Dioscorea species, particularly Dioscorea wild yam.
- **Cultivation:** Large-scale cultivation of Dioscorea plants.
- **Extraction:** Tubers are harvested, and diosgenin is extracted using solvents.

- Estimation:

- **HPLC:** Commonly used for quantitative analysis of diosgenin.
- **NMR:** Provides structural confirmation.

- Utilization:

- **Steroid Synthesis:** Diosgenin serves as a starting material for the industrial synthesis of steroid hormones.

5. Digoxin:

- Industrial Production:

- **Source:** Digoxin is derived from the leaves of Digitalis purpurea (Foxglove).
- **Cultivation:** Controlled cultivation of Digitalis plants.
- **Extraction:** Leaves are harvested, and digoxin is extracted using solvents.

- Estimation:

- **Immunoassays:** Used for quantitative determination of digoxin levels.
- **Chromatography Techniques:** HPLC or GC for accurate estimation.

- Utilization:

- **Cardiac Medication:** Digoxin is a cardiac glycoside used in the treatment of heart failure and certain arrhythmias.

6. Atropine:

- Industrial Production:

- **Source:** Atropine is extracted from the roots of Atropa belladonna (Deadly nightshade).

- **Cultivation:** Controlled cultivation of Atropa plants.
- **Extraction:** Roots are harvested, and atropine is extracted using solvents.

- Estimation:

- **Titration Methods:** Used for the determination of atropine content.
- **HPLC:** Provides precise quantitative analysis.

- Utilization:

- **Pharmaceuticals:** Atropine is used for its antimuscarinic properties, primarily in ophthalmology.

7. Podophyllotoxin:

- Industrial Production:

- **Source:** Podophyllotoxin is extracted from the roots of Podophyllum species.
- **Cultivation:** Controlled cultivation of Podophyllum plants.
- **Extraction:** Roots are harvested, and podophyllotoxin is extracted using solvents.

- Estimation:

- **HPLC:** Commonly used for quantitative analysis of podophyllotoxin.
- **NMR:** Structural elucidation.

- Utilization:

- **Anticancer Drug Synthesis:** Podophyllotoxin is a precursor for the synthesis of etoposide and teniposide, potent anticancer drugs.

8. Caffeine:

- Industrial Production:

- **Source:** Caffeine is obtained from the seeds of Coffea arabica (Coffee plant) and Camellia sinensis (Tea plant).
- **Cultivation:** Large-scale cultivation of coffee and tea plants.
- **Extraction:** Seeds are harvested, and caffeine is extracted using organic solvents.

- Estimation:

- **HPLC:** Standard method for quantitative determination of caffeine content.
- **UV Spectrophotometry:** Used in routine analysis.

- Utilization:

- **Beverages:** Caffeine is a widely consumed stimulant in coffee, tea, and energy drinks.
- **Pharmaceuticals:** Included in some medications for its stimulant effects.

9. Taxol:

- Industrial Production:

- **Source:** Taxol is extracted from the bark of *Taxus brevifolia*

PHARMACY PEERS