Aim: Preparation of Piperazine Citrate Elixir

References

1. British Pharmacopoeia Codex 1968.

2. Ansel, H. C., Allen, L. V., & Popovich, N. G. Pharmaceutical Dosage Forms and Drug

Delivery Systems.

3. Lachman, L., Lieberman, H. A., & Kanig, J. L. The Theory and Practice of Industrial

Pharmacv.

**Objective** 

To prepare Piperazine Citrate Elixir, a pharmaceutical liquid formulation, and understand the

procedure, properties, and quality control tests associated with its preparation.

Introduction

Elixirs are clear, sweetened, and flavored hydro-alcoholic solutions designed to deliver active

pharmaceutical ingredients (APIs) in a palatable form. Piperazine Citrate Elixir is an

anthelmintic preparation used for the treatment of parasitic worm infections, especially

ascariasis and enterobiasis.

**Principle** 

The formulation involves the dissolution of Piperazine Citrate in a hydro-alcoholic base

containing a sweetener and flavoring agents to ensure solubility, stability, and patient

compliance.

**Materials and Equipment** 

**Chemicals Required:** 

Piperazine Citrate: 12 g

Ethanol (95%): 50 mL

Sucrose: 60 g

Purified Water: Quantity Sufficient (QS) to 1000 mL

Glycerin: 10 mL

Flavoring agent (e.g., Lemon essence): 5 mL

## **Apparatus Required:**

- Beaker (1000 mL)
- Measuring cylinder
- Glass rod
- Funnel
- Filtration assembly

#### **Procedure**

## 1. Dissolution of Piperazine Citrate:

 Dissolve 12 g of Piperazine Citrate in approximately 800 mL of purified water. Stir until completely dissolved.

# 2. Preparation of Sweetening Solution:

• Dissolve 60 g of sucrose in the above solution with continuous stirring.

## 3. Addition of Co-solvents:

- Add 10 mL of glycerin to the solution.
- Gradually add 50 mL of ethanol (95%) while stirring.

## 4. Flavoring:

• Incorporate 5 mL of the chosen flavoring agent (e.g., lemon essence) into the solution.

# 5. Adjusting Volume:

• Make up the final volume to 1000 mL with purified water. Mix thoroughly.

## 6. Filtration:

• Filter the solution using a filtration assembly to ensure clarity.

# 7. Packaging and Storage:

- Transfer the prepared elixir into clean, amber-colored bottles with airtight caps.
- Store in a cool, dry place away from direct sunlight.

#### **Observation and Results**

- Appearance: Clear, colorless liquid.
- Taste: Sweet with a hint of flavor (e.g., lemon).
- Odor: Pleasant, depending on the flavoring agent used.

## **Quality Control Tests**

- 1. Clarity Test: The elixir should appear clear and free from particulate matter.
- 2. **pH Test:** Measure the pH of the elixir. It should be within the range of 5 to 7.
- 3. **Assay of Piperazine Citrate:** Perform an assay to determine the concentration of Piperazine Citrate using titrimetric or spectrophotometric methods.
- 4. **Specific Gravity:** Measure using a hydrometer. It should meet the pharmacopoeial standards.
- 5. Alcohol Content: Verify the ethanol content using distillation or gas chromatography.

#### Discussion

Role of Ethanol and Glycerin: Ethanol acts as a solvent for the active ingredient, while glycerin improves sweetness and viscosity.

**Importance of Filtration:** Filtration ensures the elixir is clear, enhancing its aesthetic appeal and patient compliance.

**Flavoring Agents:** Adding flavoring agents masks any unpleasant taste of Piperazine Citrate, making it suitable for pediatric use.

## **Applications**

- Used in the treatment of roundworm (ascariasis) and pinworm (enterobiasis) infections.
- Suitable for administration in children and adults due to its palatability.

### **Precautions**

- 1. Ensure accurate weighing of all ingredients to maintain therapeutic efficacy.
- 2. Store the elixir properly to prevent degradation or microbial growth.
- 3. Use purified water to avoid impurities that may affect clarity.