



# SYNTHESIS OF HEXAMINE

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Organic Chemistry I (PHAR 205)

Fall Semester

Week Eight

27/11/2023



# Outline

- ✓ Hexamine
- ✓ Principle
- ✓ Structure and Mechanism
- ✓ Procedure



# Objectives

- Synthesis of Hexamine.



# Principle

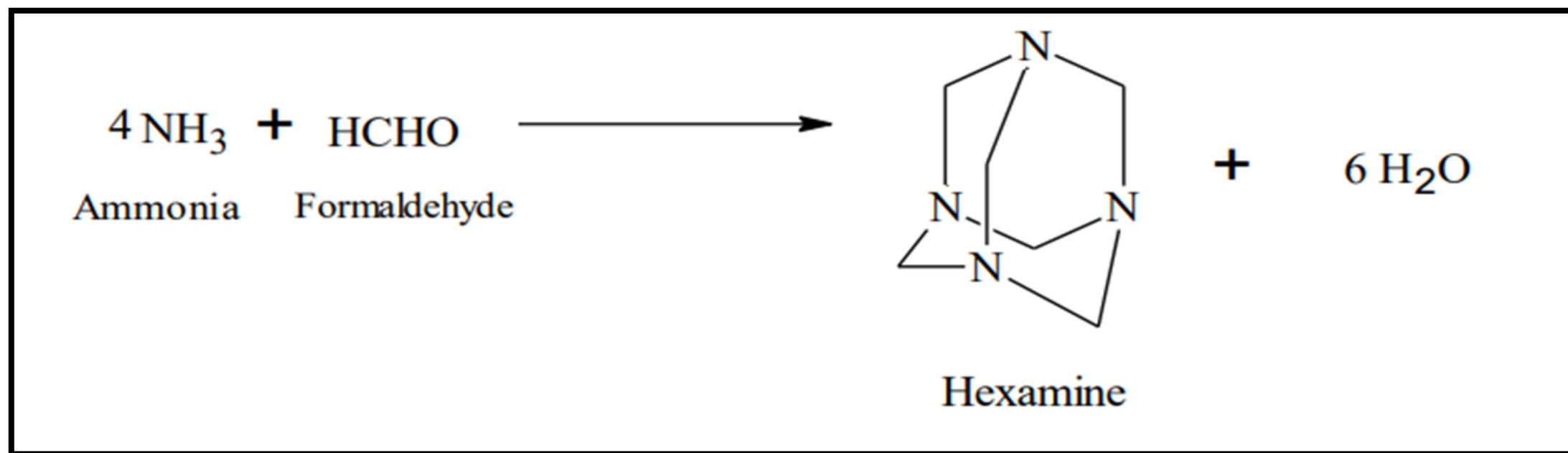
- Hexamine is heterocyclic organic compound  $(\text{CH}_2)_6\text{N}_4$ .
- It is also known as Hexamethylenetetramine.
- It has symmetrical tetrahedral cage- like structure.



# Principle

- Hexamethylenetetramine or Urotropin. It acts as an anti-infective agent which is most commonly used to treat urinary tract infections.
- It can be prepared by condensation reaction between formaldehyde and ammonia.

A general equation for the formation of **Hexamine**:



# Physical properties and Use



- The chemical formula for hexamine can be given as  $C_6H_{12}N_4$ ,
- The density of Hexamine is  $1.33 \text{ g/cm}^3$ ,
- The molecular weight of  $C_6H_{12}N_4$  is  $140.186 \text{ g/mol}$ ,
- The Melting point of Hexamine can be given as  $280 \text{ }^\circ\text{C}$ ,
- The odor of this compound is Fishy (Ammonia like).
- Urinary anti-infective agent.

# Procedure



- About 4.7g of 30% formaldehyde solution was taken in a beaker and add 7g of 24% ammonia solution, until the solution is slightly alkaline. The mixture was heated on a water bath for 5 minutes and allowed to stand for 15 minutes. The solution was filtered and then evaporated on a direct flame using china dish to a thick paste.
- The hexamine crystals are obtained and dried.
- It was recrystallized from water or alcohol. Hexamine forms colorless, odorless crystals, which are soluble in water and 90% alcohol.





# Report

- Hexamine was prepared and submitted. Report the following:
  - Theoretical Yield
  - Practical Yield
  - Percentage Yield

# Calculation



Will be explained in lab

$\% \text{ of the yield} = \text{Practical yield} / \text{Theoretical mass} \times 100$