

Unit V. Amines

A. Introduction

1. Structure
2. Nomenclature
3. Chirality
4. Basicity

B. Synthesis of Amines

1. Alkylation
 - a. S_N2
 - b. Gabriel Synthesis
2. Reductive Amination
3. Acylation-Reduction
4. Reduction of Azides
5. Reduction of Nitriles
6. Hofmann Rearrangement

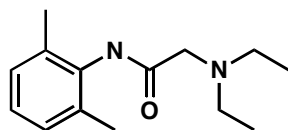
C. Reactions of Amines

1. Eliminations
 - a. Hofmann
 - b. Cope
2. Formation of Diazonium Salts
 - a. Alkyl Amines
 - b. Aryl Amines
 - c. Example

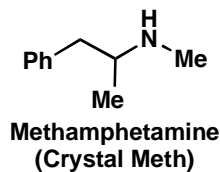
Suggesting reading : Chapter 24

Suggested problems: 24.30, 24.31, 24.35-24.46, 24.49, 24.50, 24.53, 24.54, 24.56, 24.61-24.63

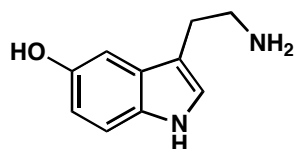
AMINES! (smell bad - fishy)



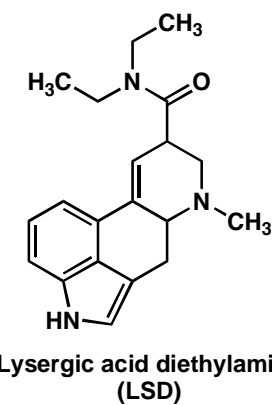
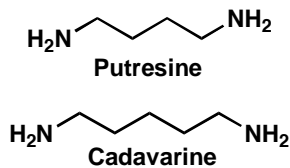
Lidocaine



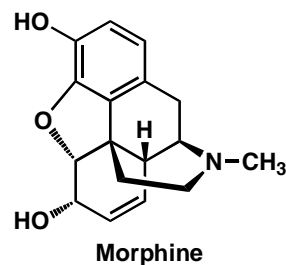
Methamphetamine
(Crystal Meth)



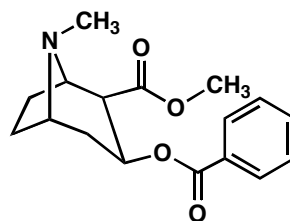
Serotonin



Lysergic acid diethylamide
(LSD)



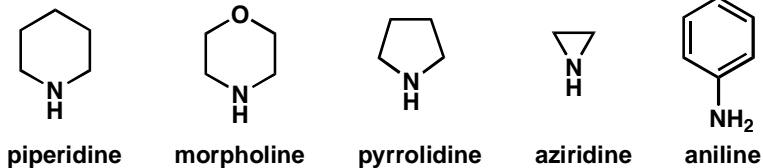
Morphine



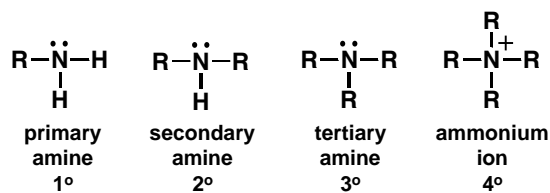
Cocaine

2. Nomenclature

b. Common Names



c. Classification of sp^3 N by C-N connectivity



Amine Summary

From:

- Alkyl halide
 - S_N2 (overalkylation)
 - Gabriel Synthesis (1°)
 - Azide reduction (adds $-\text{NH}_2$)
 - Nitrile reduction (adds $-\text{CH}_2\text{NH}_2$)
- Aldehyde/ketone - Reductive amination
 - H_2NOH for 1° , RNH_2 for 2° , R_2NH for 3°
- Acyl Chloride - Acylation-Reduction (adds -R)
 - NH_3 for 1° , RNH_2 for 2° , R_2NH for 3°
- Amide - Hofmann Rearrangement
- Ar-NO_2 (H_2/Pd)

To:

- Alkene
 - Hofmann Elimination
 - Cope Elimination
- Diazonium Salt (NaNO_2 , HCl)
 - Ar-Br (CuBr)
 - Ar-Cl (CuCl)
 - Ar-CN (CuCN)
 - Ar-OH ($\text{H}_3\text{O}^+/\text{H}_2\text{O}$)
 - Ar-H (H_3PO_2)
 - Ar-I (KI)