

CHAPTER OVERVIEW

10: AMINES AND HETEROCYCLES

LEARNING OBJECTIVES

When you have completed Chapter 24, you should be able to

1. fulfill all of the detailed objectives listed under each individual section.
2. design a multi-step synthesis that involves the use of any of the reactions described in this unit, and any of the reactions described in any previous unit.
3. solve road-map problems that require a knowledge of amine chemistry in addition to any of the chemistry discussed in previous units.
4. define, and use in context, the key terms introduced.

Amines are the first nitrogen-containing compounds that we study in detail in this course. We begin the chapter with an explanation of the differences in structure among primary, secondary and tertiary amines. We explain the nomenclature of aliphatic and arylamines, and examine the structure and bonding of these compounds, relating these features to their physical properties and basicity. We describe the use of amines to resolve racemic mixtures of chiral carboxylic acids.

Amines may be prepared by a number of different synthetic methods. We describe each of these methods and assess the relative merits of each. After a description of the reactions of aliphatic amines, we devote sections to a discussion of the use of tetraalkylammonium salts as phase-transfer agents. The chapter concludes with a summary of the spectroscopic properties of amines.

[10.1: Chapter Objectives](#)

[10.2: Naming Amines](#)

[10.3: Structure and Properties of Amines](#)

[10.4: Basicity of Amines](#)

[10.5: Basicity of Arylamines](#)

[10.6: Biological Amines and the Henderson-Hasselbalch Equation](#)

[10.7: Synthesis of Amines](#)

[10.8: Reactions of Amines](#)

[10.9: Reactions of Arylamines](#)

[10.10: Heterocyclic Amines](#)

[10.11: Spectroscopy of Amines](#)

[10.12: Additional Problems](#)

[10.S: Amines and Heterocycles \(Summary\)](#)

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