

CHAPTER OVERVIEW

17: ALCOHOLS AND PHENOLS

LEARNING OBJECTIVES

When you have completed Chapter 17, you should be able to

1. fulfill all of the detailed objectives listed under each individual section.
2. design a multi-step synthesis using any of the reactions introduced in this chapter, together with any number of the reactions discussed in *Chemistry 350*.
3. solve “road-map” problems that require a knowledge of the chemistry of alcohols and phenols, in addition to the chemistry of the other classes of compounds discussed in *Chemistry 350*.
4. define, and use in context, the key terms introduced in this chapter.

In this chapter, we examine the chemistry of the alcohol family of compounds. Alcohols can undergo a wide variety of reactions, and because of this reactivity and because they can be prepared in a number of different ways, alcohols occupy an important position in organic chemistry.

The discussion begins with an outline of the nomenclature of alcohols and phenols. We review the physical properties of these compounds, and discuss methods used to obtain the lower members of the series on an industrial scale. A detailed discussion of the laboratory preparation of alcohols follows, with particular emphasis on those methods that involve either the reduction of a carbonyl compound or the use of a Grignard reagent.

Certain reactions of alcohols were discussed in previous chapters. In this chapter, we concentrate on the oxidation of alcohols to carbonyl compounds. We also introduce the concept of protecting a sensitive functional group during an organic synthesis. The discussion then turns to the uses of phenols, their preparation and their chemical reactivity.

Infrared, nuclear magnetic resonance and mass spectroscopy each can provide valuable information about alcohols and phenols, and we illustrate the application of these techniques to the identification of unknown alcohols and phenols with a number of examples.

[17.0: Introduction to Alcohols and Phenols](#)

[17.1: Naming Alcohols and Phenols](#)

[17.2: Properties of Alcohols and Phenols](#)

[17.3: Preparation of Alcohols- A Review](#)

[17.4: Alcohols from Carbonyl Compounds- Reduction](#)

[17.5: Alcohols from Carbonyl Compounds - Grignard Reagents](#)

[17.6: Reactions of Alcohols](#)

[17.7: Oxidation of Alcohols](#)

[17.8: Protection of Alcohols](#)

[17.9: Phenols and Their Uses](#)

[17.10: Reactions of Phenols](#)

[17.11: Spectroscopy of Alcohols and Phenols](#)

[17.S: Alcohols and Phenols \(Summary\)](#)

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