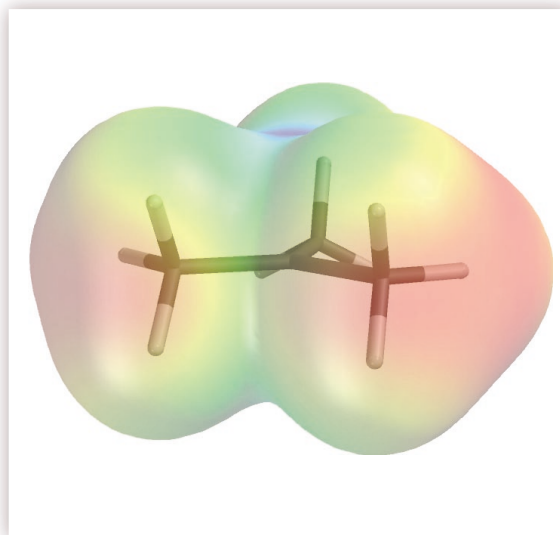


CHAPTER OUTLINE

- 3.1 Nomenclature of Alcohols and Alkyl Halides
The Common Alcohols: Methyl, Ethyl, and Isopropyl Alcohol
- 3.2 Classes of Alcohols and Alkyl Halides
- 3.3 Bonding in Alcohols and Alkyl Halides
- 3.4 Physical Properties of Alcohols and Alkyl Halides: Intermolecular Forces
- 3.5 Acids and Bases: General Principles
- 3.6 Acid–Base Reactions: A Mechanism for Proton Transfer
- 3.7 Preparation of Alkyl Halides from Alcohols and Hydrogen Halides
- 3.8 Mechanism of the Reaction of Alcohols with Hydrogen Halides
- 3.9 Structure, Bonding, and Stability of Carbocations
- 3.10 Electrophiles and Nucleophiles
- 3.11 Reaction of Primary Alcohols with Hydrogen Halides
Learning Objectives
- 3.12 Summary
Additional Problems

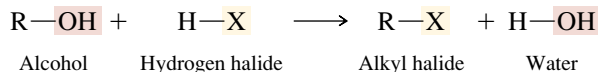


CHAPTER 3

ALCOHOLS AND ALKYL HALIDES

Our first two chapters established some fundamental principles concerning the *structure* of organic molecules. In this chapter we begin our discussion of organic chemical *reactions* by directing attention to **alcohols** and **alkyl halides**. These two rank among the most useful classes of organic compounds because they often serve as starting materials for the preparation of numerous other families.

One reaction leading to alkyl halides that will be described in this chapter illustrates functional group transformations. In this reaction the hydroxyl (—OH) group of an alcohol is replaced by halogen on treatment with a hydrogen halide.



This reaction is classified as a **substitution**, a term that describes the relationship between reactants and products—one functional group replaces another. In this chapter we go beyond the relationship of reactants and products and consider the mechanism of each reaction. A **mechanism** attempts to show *how* starting materials are converted into products during a chemical reaction.

While developing these themes of reaction and mechanism, we will also use alcohols and alkyl halides as vehicles to extend the principles of IUPAC nomenclature, continue to develop concepts of structure and bonding, and see how structure affects properties. A review of **acids** and **bases** constitutes an important part of this chapter in which a qualitative approach to proton-transfer equilibria will be developed that will be used throughout the remainder of the text.