
This volume, the thirty-third in the series, provides a compilation of the articles on organic reactions mechanisms published from December 1996 to November 1997. The book is full of useful information and the text is concise but appropriately illustrated with schemes, figures and tables.

Chapter 1 covers the reactions of aldehydes and ketones. It includes the formation and reactions of enols, acetals, glucosides and nucleosides, nitrogen derivatives and ketenes. Several addition reactions are discussed. The chapter finishes, dealing with oxidation and reduction reactions and regio-, enantio- and diastereoselectivity issues are discussed and illustrated with examples. The mechanism and order of several oxidation reactions by metallic and non-metallic compounds are discussed in more detail in Chapter 5. This chapter also mentions several reviews published over this period on the subject of reduction reactions.

Chapter 2 comprises the reactions of carboxylic acids and derivatives in protic and aprotic solvents including examples of intra- and intermolecular catalysis. Largely illustrated, it starts with an interesting discussion on the involvement of zwiterionic tetrahedral intermediates in a number of systems. The subject of enzymatic catalysis deserves a special mention. The reactions of phosphorus- and sulphur-containing acids are also included.

The mechanisms of several radical reactions are reviewed in Chapters 3 and 4. Chapter 3 includes the most common radical reactions (rearrangements, additions, and substitutions) and radical reagents (peroxides). Other uses of radical species, as redox and electron transfer reactions, are discussed in Chapter 4.

The chemistry of carbenes and nitrenes is the subject of Chapter 6. The generation, reactivity and selectivity of these reaction intermediates is reviewed and illustrated with several examples.

Chapters 7 and 8 deal with nucleophilic and electrophilic aromatic substitution. Several experimental and theoretical studies in the subject of S_nAr mechanisms are included in Chapter 7 whereas Chapter 8 discusses the mechanisms of addition of different reagent systems in halogenation, nitration and Friedel–Crafts reactions.

The formation, structure and stability of carbocationic species are reviewed in Chapter 9. Chapter 10 explores the most common nucleophilic substitutions in aliphatic systems, such as vinylic substitutions, S_n2-type reactions in allylic systems, substitutions in polycyclic systems, alkylations using Grignard compounds and ring-opening of epoxides and other small rings. Continuing with the subject of substitution, Chapter 11 deals with the chemistry of carbamions, their structure, stability and main substitution reactions. The addition of carbamions to carbonyls is also included, overlapping to a certain degree with Chapter 1. The chapter finishes with a brief study of proton-transfer and electrophilic aliphatic substitution reactions.

Elimination reactions are the subject of Chapter 12. Together with the expected pyrolysis and solvolysis reactions this chapter also includes a discussion on the use of Wittig and Horner–Emmons reactions in organic synthesis.

Additions to double bonds are discussed in Chapter 13. It comprises electrophilic additions, including Heck reaction and other additions of organometals as electrophiles, and nucleophilic additions, mainly Michael reactions. Chapter 14 describes the mechanisms of intra- and intermolecular cycloadditions, both photochemical and thermal including metal-catalysed and tandem reactions. Due to its importance in organic chemistry, the Diels–Alder reaction deserves a special treatment in this chapter. Chapters 13 and 14 are both profusely illustrated and selectivity issues are discussed in a large number of examples.

Chapter 15, entitled Molecular Rearrangements, is the larger in the volume (130 pages) and includes the larger number of references (649). Regardless of its length it reads nicer than some previous chapters as it is illustrated with plenty of detailed schemes.

In spite of the lack of continuity among chapters and the absence of introductory sections this is a well-presented text with very few errors, minimal overlapping and extensive references. It constitutes a comprehensive review on the subjects discussed and therefore can be used as an easy access to the relevant literature on reaction mechanisms over the mentioned period.

B. Dominguez, Synetix Chiral Technologies, UK.