

Publication information, ISBN, Title and copyright pages for Volumes I – VI (all editions and reprints) of “Study Guide to Organic Chemistry – A Problem Solving Approach” by Chandan Saha, Suchandra Chakraborty, Ahana Saha and Kaushik Basu can be found [here](#).

Written in a lucid and student-friendly conversational tone SGtOC adopts a logical and problem-solving approach in its aim to develop the basic understanding of organic chemistry suitable for an undergraduate and graduate audience. The discussion is supplemented by thoughtfully designed graphics and the text is combined with sets of hundreds of problems arranged according to levels of increasing difficulty. The solution to all these problems are supplied at the end of each chapter which makes this book suitable for use as a self-study guide. The topics discussed in each volumes are outlined below:

Volume-I:

1. 1. Basic concepts, 2. Stereochemistry, 3. Dipole moment, melting and boiling points of organic compounds and their variations, 4. Molecular orbital theory, 5. Aromaticity, 6. Chemistry of reactive Intermediates (carbocations, carbanions, radicals, carbenes).

Volume-II:

1. 1. Acid-base chemistry and tautomerism in organic molecules, 2. Halogenation reaction and preparation of alkanes, 3. Nucleophilic substitution and elimination reactions of saturated substrates, 4. Nucleophilic acyl substitution with a special emphasis on esterification reactions and ester hydrolysis, and 5. Six Name Reactions, which include Arndt-Eistert reaction, Pinacol-pinacolone rearrangement, α -halogenation of carbonyl compounds, Hell-Volhard-Zelinsky halogenation, Hunsdiecker reaction and Cumene-phenol process.

Volume-III:

1. 1. Chemistry of alkenes: preparation and reactions, 2. Chemistry of dienes: preparation and reactions, 3. Chemistry of alkynes: preparation and reactions, 4. Wittig and related olefination reactions, 5. Nucleophilic addition to carbonyl: chemistry of acetals, 6. Synthetic applications of nucleophilic substitution on aliphatic systems, 7. Chemistry of organometallic compounds including basic ideas about organotransition metal chemistry, 8. Redox reactions: Oxidations of alcohols, chemistry of quinone, TEMPO-based oxidations, 9. Redox reactions: Reductions by LAH and sodium borohydride, reduction of carboxylic acid derivatives to aldehydes, Clemmensen, Wolff-Kishner, Mozingo and Birch Reductions, 10. Organic hydride transfer reductions: Cannizzaro Reaction, Tischenko Reaction, Tollens Condensation, Benzil-Benzilic acid Rearrangement, MPV Reduction and Oppenauer Oxidation.

Volume-IV:

1. 1. Aldol Condensation and related reactions: Aldol Reaction, Henry Reaction, Knoevenagel Reaction, Mannich Reaction, Reformatsky Reaction, Perkin Reaction, Stobbe Condensation, Darzens Glycidic Ester Condensation, 2. Name Reactions relating to carbon to heteroatom migration: Beckmann Rearrangement, Schmidt Reaction on ketones, Baeyer-Villiger Oxidation, Dakin Reaction, 3. Name Reactions relating to carboxylic acids and derivatives: Hofmann, Lossen, Curtius and Schmidt Rearrangement, 4. Name Reactions on synthesis of α -hydroxyketones: Acyloin and Benzoin Condensation, 5. Claisen Condensation and Claisen Rearrangement, 6. Chemistry of Enamines, 7. Chemistry of Diazomethane and Diazoacetic ester, 8. Aromatic Electrophilic Substitution and its Applications in Organic Synthesis, 9. Aromatic Nucleophilic Substitution and its Applications in Organic Synthesis, 10. Synthesis of Benzenoid Aromatics.

Volume-V:

1. 1. Chemistry of polycyclic aromatic hydrocarbons (PAHs), including synthesis and reactions of biphenyl, diphenylmethane, triphenylmethane, naphthalene, anthracene and phenanthrene, 2. The logic of organic syntheses based on retrosynthesis strategy, including detailed coverage of α,β -unsaturated carbonyl compounds, Michael reaction, application of Aldol and Claisen Condensations and Diels-Alder reactions in organic syntheses. A few multistage syntheses of

relatively simple target molecules are also provided. The concept of latent polarities, classification of target molecules to consonant and dissonant systems and the usefulness of this approach in choosing the right disconnection is discussed at length , 3. Favorskii Rearrangement and its applications, 4. Chemistry of heterocyclic compounds containing one heteroatom, namely, the properties, reactions and synthesis of furan, pyrrole, thiophene, indole, pyridine, quinolone and isoquinoline, and, 5. A comprehensive and comparative study of intra- versus intermolecular reactions, including discussions on Thorpe-Ingold Effect, Neighbouring Group Participation (NGP), high dilution technique and Baldwin's rules of ring closure.

Volume-VI:

1. Chemistry of alicyclic compounds (cyclohexane, cyclohexene and cyclohexanone), 2. Stereoselective aspects of organic synthesis, 3. Chemistry of biomolecules: carbohydrates, amino acids, peptides, proteins and nucleic acids, 4. Organic spectroscopic techniques (UV-Vis, IR, NMR and Mass) and 5. Aromaticity (in relation to NMR spectroscopy)

N.B. Addendum to Volume VI:

1. Solution to Problem IV and Problem V for Part 2 of Chapter 1 can be downloaded from [here](#).
2. Solution to Problem I for Chapter 5 can be downloaded from [here](#).