

Recent Advances in Organic Synthesis Techniques

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Abstract: Organic synthesis has undergone significant transformations, driven by the need for more sustainable, efficient, and precise methodologies. This paper explores recent innovations in synthetic strategies, highlighting advancements in catalytic systems, reaction mechanisms, and environmentally friendly approaches. The development of transition-metal catalysis, organocatalysis, and biocatalysis has expanded the scope of molecular construction, enhancing selectivity and atom economy. Additionally, the integration of computational chemistry, artificial intelligence, and automation has revolutionized reaction optimization, streamlining synthetic pathways and accelerating the discovery of novel compounds. These advancements not only improve efficiency but also contribute to greener and more resource-efficient processes. This review discusses key breakthroughs, current challenges, and future directions in organic synthesis, emphasizing the role of interdisciplinary research in shaping the next generation of chemical transformations.

Keywords: Organic synthesis, catalytic systems, sustainable chemistry, computational chemistry, artificial intelligence, automation, synthetic strategies, green chemistry, molecular design

