



Saarth E-Journal

Saarth E-Journal of Research

E-mail: sarthejournal@gmail.com
www.sarthejournal.com

ISSN NO: 2395-339X
Peer Reviewed
Vol.8, Issue.4 No.04

Impact Factor: 6.89
Quarterly
Oct. to Dec - 2023

GREEN METHODS FOR SYNTHESIS OF VARIOUS HETEROCYCLIC: SUSTAINABLE APPROACH

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ABSTRACT

Advancement of green chemistry carried out a number of challenges to those who applied chemistry in medicine industry, education and research. The start of green chemistry is considered as a revolution to the need to reduce the environment damage and human health risk by synthetic materials and the pathways used to make them. The preferable application of green chemistry in research is to utilize environment benign, mild, nontoxic, reproducible catalyst and efficient solvents in synthesis of chemicals.

KEY WORDS: Green chemistry, environment, green catalyst, chemical synthesis.

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INTRODUCTION

Today, chemistry plays a key role to improve and maintain our quality of life. The race of the chemical industry causes adverse effect on the natural environment and human health. In 1990 the USEPA (Environmental Protection Agency) gives the term “Green Chemistry” to precede chemical processes that eliminate the use of toxic or harmful substances in synthesis and manufacturing. The great profit came from pharma industries and research laboratories with design and synthesis of organic molecules. Green chemistry aims

to eliminate the release of any hazardous bi-products and increase the yield of the target compound without spoil the environment. Paul Anastas and John C. Warner (1998) ^[1] states that green chemistry is the utilisation of a set of principles that reduces or eliminates the use of hazardous substances in the design of reaction mechanism, prevention of waste, maximize the atom economy, use of safer solvents, reduce derivatization and design for energy efficiency.

Green synthesis of some bioactive heterocyclic compounds by using different techniques and biocatalyst

Heterocyclic compounds are those compounds which contain at least different atoms other than carbon. Heterocyclic compounds represent the major class of bioactive organic compounds. Target of green chemistry is to overcome the negative environmental effects due to various hazardous chemicals used in synthetic pathways. The following examples show a vast use of green chemistry in synthesis of heterocyclic compounds.

Using grinding method

Bose *et al*, 2004 reported the synthesis of ethyl6-methyl-4-phenyl-2-thioxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate (I) with grinding technique by using Biginelli reaction. This method is simple, easy work up and environmentally benign.

