



One Pot and Two Pot Synthetic Strategies and Biological Applications of Epoxy-Chalcones

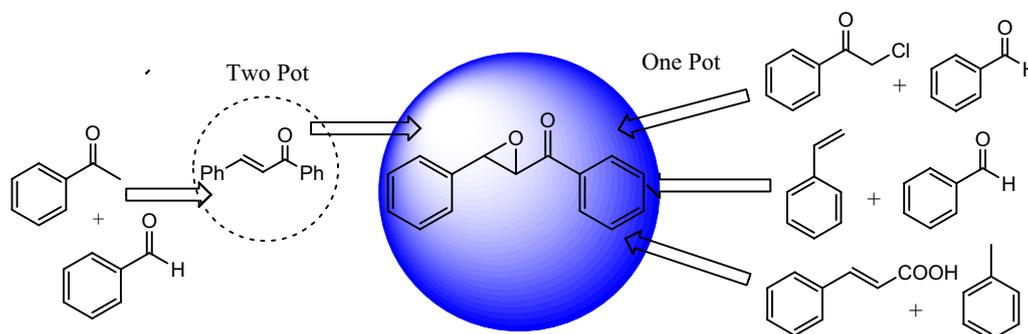
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Abstract

Epoxy chalcone is a heterocyclic molecule and an important precursor for the synthesis of biologically active compounds. This mini-review is elucidating the synthetic strategies of chalcone epoxide via one pot and two pot routes including nature of reactants, nature of catalyst and variety of catalyst to improve yield of desired product, biological applications and advantages and drawbacks of these synthetic strategies. One pot route has wide variety of reactants and efficient one is the condensation of aldehyde and ketone. However, two pot route is consisted of chalcone synthesis preceding to epoxy chalcone. The synthetic routes for the preparation of epoxy chalcone and the usage as a precursor for the synthesis of various organic molecules with biological application is comprehensively discussed. This review is outstanding in organic chemistry and pharmaceutical industries to produce new molecules with various applications.

Graphic Abstract



Keywords Epoxide · Oxidant · One pot · Enzyme · Catalyst · Chalcone

1 Introduction

Designing of novel heterocyclic molecules bearing epoxide groups has gained momentous interest among researchers. Epoxide or epoxy group is a three membered cyclic ether

with two carbons and one oxygen atom. The common name of epoxide is ethylene oxide or oxirane [1]. Epoxide is commonly employed as a precursor for the synthesis of various active compounds via ring opening reaction [2]. Several synthetic methodologies have been reported for the preparation of epoxide namely Johnson–Corey–Chaykovsky epoxidation [3], Sharpless epoxidation [4, 5] olefin peroxidation [6], dehydrohalogenation [7] and Jacobsen–Katsuki epoxidation [8].

Epoxy chalcone is a fascinating heterocyclic molecule which can be prepared via oxidation reaction of carbon–carbon double bond of chalcone's network to form α , β -epoxy ketone with three membered ring containing ether group.

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