

ABSTRACT

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Title of the Thesis:

Development of New Methodology for Different Organic Transformations

Submitted by:

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The purpose of the study embodied in the aforesaid thesis was to develop alternative protocols for important organic reactions aiming at the functional group transformations along with the construction of important molecular skeletons. In order to proceed for a 'sustainable future' inexpensive and eco-compatible reagents as well as recyclable catalysts were involved under mild reaction conditions implementing good yield, unique reactivity and excellent chemoselectivity towards the reaction outcome. All of the synthesized products were duly characterized with different spectroscopic and analytical techniques. Entire investigations have been divided into **three Chapters**.

Chapter-I deals with a transition metal-free Cross Dehydrogenative Coupling (CDC) reaction for the synthesis of aryl esters starting from benzylic alcohols as the substrates using *t*-butyl hydroperoxide (TBHP) as a terminal oxidant in the presence of catalytic amount of tetrabutylammonium iodide (TBAI) and imidazole.

In **Chapter-II**, commercially available Amberlyst®-15(H) has been utilised efficiently as an air-stable, heterogeneous, inexpensive solid acid catalyst which was reused consecutively up to several times with marginal loss of its catalytic activity. This catalytic system was used under different solvent systems for the formation of C–N as well as C–O bond in chemoselective fashion with wide structural variation. Additionally, differently substituted conjugated dienes were prepared through the cleavage of cyclopropane ring of aptly substituted cyclopropylcarbinols with good yield.

Chapter-III includes the chemoselective reduction of α -heteroatomic esters using NaBH₄ in methanol as a mild reducing agent at room temperature.

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