

ABSTRACT

The thesis entitled, "Approaches Towards Stereocontrolled Medium Cyclic Rings and Related Studies" has been divided into six chapters. Control and prediction of stereochemistry in medium cyclic rings are the premier concerns in current organic synthesis. This thesis describes a way out via a novel conformational protection and deprotection methodology, where a 10 or 12-membered ring could be generated from a readily available locked hexacyclic compound. Evidently, locked conformations have the promise of predicting the stereochemistry of its substituents. After a brief overview of literature pertaining to the complexity of problem and the various methodologies available for stereocontrolled medium cyclic rings, especially with a stress on the recent work carried out by Clark Still and Vedejs group, additional stereocontrol has been achieved in the diene frame of hexacyclic compounds via π -facial selectivity inherent in the system. Subsequently, substituent effects for [2+2] photocycloadditions of aryl-olefins have been delineated. During the unlocking of the rigid frame via ketone photochemistry, some unprecedented facts, e.g. efficient ketalization, β -cleavage in cyclobutyl ketones and dual epimerization were encountered. Finally, a methodology has been developed for a smooth entry into the 10-membered ring with stereocontrol possibilities. The last chapter describes an efficient synthesis of a recently marketed anti-arthritic drug, Diacerhein, via retro Diels-Alder strategy.