INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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SHORT ABSTRACT

The contents of the present thesis entitled as "***Organocatalytic acyl transfer reaction of 1,3-diketones and convenient synthesis of Pyrazolone derivatives***" has been divided into five chapters based on the results achieved from the experimental works performed during the entire course of the Ph.D. research programme.

Chapter I of this thesis gives a brief review of Organocatalytic Michael reaction and Rauhut Currier reactions. This chapter mainly focuses on cinchona-derived catalysts as they were utilized primarily in the demonstrated works. A brief discussion has also been made on the Pyrazolone moiety. **Chapter II** describes the bifunctional thiourea catalyzed asymmetric organocatalytic Michael/Hemiketalization/ Retro-Aldol Reaction between 1,3-diketones and (E)-2-(2-nitrovinyl) phenols. Using Cinchonidine derived thiourea catalysts, high yields and excellent enantioselectivities were obtained. **Chapter III** demonstates DMAP Catalyzed Domino Rauhut-Currier Cyclization Reaction between Alkylidene Pyrazolones and Nitro-olefins to give Tetrahydropyrano[2,3-c]Pyrazoles. The products were obtained in moderate to high yields with excellent diastereoselectivities under ambient reaction conditions with DMAP catalyst. Chiral DMAP catalysts were used to perform a preliminary catalytic asymmetric variant. **Chapter IV** presents an Organocatalytic Asymmetric Inverse-Electron-Demand Oxa-Diels-Alder Reaction of Allyl Ketones with unsaturated pyrazolones. Quinine derive thiourea catalysts were used to form tetrahydropyrano[2,3-c]pyrazole products with in moderate to good yields with high diastereo- and enantioselectivities under ambient reaction conditions. **Chapter V** describes Quinine derived squaramide catalyzed synthesis of spiro-tetrahydropyran-pyrazolones via Organocatalytic asymmetric oxa-Michael-Michael reaction between 3-aryl-2-nitroprop-2-enols and unsaturated

pyrazolones. The products were furnished in acceptable yields with perfect diastereomeric ratios as well as good to excellent enantioselectivities. This is the first report of utilization of 3-aryl-2-nitroprop-2-enol as O-nucleophile in enantioselective catalysis.