Table of Contents

Chapter I	***Theoretical approach and Review work***	**Page no (1-45)**
	1,3-dipole	2
	Reactivity profile of 1, 3-dipoles	4
	Nomenclature	5
	Synthesis of nitrones	8-11
	1,3-dipolar cycloaddition reaction	12-15
	Stereoselectivity in nitrone cycloaddition	16-17
	Regioselectivity in nitrone cycloaddition	18-19
	Current literature survey	19-41
	References	42-45
Chapter II	***Experimental section***	**(46 – 115)**
	General method for Preparation of chlorohydrin and its tautomer	46
	General method for Preparation of *N*-methyl & *N*-phenyl-α-chloro nitrones (**1a & 1b**)	47
	Reaction type I	
	Nitrone 1a with alkenes	
	1. *N*-methyl maleimide (product 2a & 2b)	49
	2. *N*-phenyl maleimide (product 3a & 3b)	50
	3. *N*-cyclohexyl maleimide (product 4a & 4b)	51
	4. Ethyl acrylate (product 5)	53
	5. Styrene (product 6)	54
	Nitrone 1a with alkynes	
	6. Phenyl methyl propiolate (product 7a & 7b)	55
	7. Dimethyl acetelene dicarboxylate (product 8a & 8b)	56
	8. Acetelene dicarboxylic acid (product 9a & 9b)	57
	Reaction Type II	
	Nitrone 1b with alkenes	
	9. Cyclohexene (product 10 a & 10b)	59
	10. *N*-methyl maleimide (product 11a & 11b)	60
	11. *N*-phenyl maleimide (product 12a & 12b)	61
	12. *p*-OMe-*N*-phenyl maleimide (product 13a & 13b)	62
	13. Acenapthylene (product 14a & 14b)	64
	14. Methyl vinyl ketone (product 15)	65

Nitrone 1b with alkynes

15. Ethyl propiolate (product 16a & 16b) 66
16. Dimethyl acetylene dicarboxylate (product 17a & 17 b) 67
17. Phenyl methyl propiolate (product 18a & 18b) 69
18. Acetylene dicarboxylic acid (product 19a & 19b) 70

Reaction Type III

General method for Preparation of *N*-methyl chloral nitrone (**1c)** 72

Nitrone 1c with alkenes

19. *N*-methyl maleimide (product 20a & 20b) 72
20. *N*-phenyl maleimide (product 21a & 21b) 74
21. *N*-cyclohexyl maleimide (product 22a &22b) 75
22. Ethyl acrylate (product 23) 77
23. Styrene (product 24) 78

Reaction type IV

24. a) Atom efficient aldehyde synthesis 79 – 82
    b) Atom efficient ketone synthesis 82 – 85
25. Synthesis of 1,3 amino alcohols 86

Biological activity of the new isoxazolidine & isoxazoline derivatives 88 – 92

References 93 – 94

Annexure (Spectra) 95 – 114

Chapter III ***Results and Discussion*** **(115 – 150)**

Synthesis of *N*-methyl-α-chloro nitrone (**1a**) 115

Synthesis of *N*-phenyl-α-chloro nitrone (**1b**) 115

General discussions on regio and stereoselectivity of the cycloadducts 116- 126

Interpretation of the mass spectra 127 – 136

Interpretation of ^{1}H NMR spectra 137 – 142

Interpretation of ^{13}C NMR Spectra 143

Interpretation of other spectra 143

General discussion on new applications of nitrones 144 – 147

Discussion on biological study of new cycloadducts 147– 148

	Reference	149 – 150
Chapter IV	***Scope and Objectives***	**(151 – 158)**
	Discussion on cycloreversion	151 – 153
	Synthesis of aziridine derivatives	153
	Synthesis of peptides	154
	Biological study	155 – 156
	References	157 – 158
	Bibliography	159 -169
	Index (General)	170 -174
	Index (Author)	175 - 176