

INDEX

CONTENTS	I-III
LIST OF FIGURES	IV-VIII
LIST OF TABLES	IX-XV
LIST OF ABBREVIATIONS	XVI-XVII

CONTENTS

Titles/Subtitles	Page No.
CHAPTER 1. INTRODUCTION	01-59
1.1 Introduction	01
1.1.1 Nanosuspension	04
1.1.2 Molecular inclusion complex of drug in Cyclodextrins	25
1.2 Hypothesis	44
1.3 Selection of drugs and drugs profiles	44
1.4 Aims and Objectives	47
1.5 Plan of work	48
1.6 References	48
CHAPTER 2. LITERATURE REVIEW	60-63
2.1 Literature Review	60
2.2 References	62
CHAPTER 3. ANALYTICAL METHODS	64-120
3.1 Analytical method development and validation for estimation of Diacerein (DAR)	64
3.1.1 Materials and reagents	64
3.1.2 Analytical methods for estimation of DAR by Ultraviolet Spectroscopy	64
3.1.3 Reverse Phase High Performance Liquid Chromatography (RP-HPLC) method for estimation of DAR in formulations	74
3.1.4 RP-HPLC method for estimation of DAR in transport buffer (HBSS-Hank's balanced salt solution) used for <i>in vitro</i> gastrointestinal permeability study using Caco-2 cell model	81
3.1.5 Bioanalytical RP-HPLC method for estimation of rhein (an active metabolite of DAR) in plasma	87
3.2 Analytical method development and validation for estimation of Febuxostat (FBX)	95
3.2.1 Materials and reagents	95
3.2.2 Analytical methods for estimation of FBX by Ultraviolet Spectroscopy	96

3.2.3	Reverse Phase High Performance Liquid Chromatography (RP-HPLC) method for estimation of FBX in formulations	102
3.2.4	RP-HPLC method for estimation of FBX in transport buffer (HBSS-Hank's balanced salt solution) used for <i>in vitro</i> gastrointestinal permeability study using Caco-2 cell model	108
3.2.5	Bioanalytical RP-HPLC method for estimation of FBX in plasma	112
3.3	References	118
CHAPTER 4. BIOAVAILABILITY ENHANCEMENT OF DIACEREIN		121-213
4.1	Materials	121
4.2	Instruments	122
4.3	Part-1: Formulation of Diacerein Nanosuspension	123-182
4.3.1	Introduction	123
4.3.4	Development of DAR-NS formulation	123
4.3.3	Characterization of DAR-NS	131
4.3.4	Cell Line Studies of DAR and its formulations using Caco-2 cell line model	134
4.3.5	Pharmacokinetic evaluation of DAR-NS using <i>in vivo</i> animal model	138
4.3.6	Result and discussion	142
4.3.7	Conclusion	175
4.3.8	References	177
4.4	Part-2: Formulation of Diacerein inclusion complex with cyclodextrins	181-213
4.4.1	Introduction	181
4.4.2	Preparation of DAR inclusion complexes	181
4.4.3	Selection of Inclusion Complex	183
4.4.4	Characterization of selected Inclusion complex	185
4.4.5	Cell Line Studies of DAR and its Inclusion complex with HP- β -CD using Caco-2 cell line model	187
4.4.6	Pharmacokinetic evaluation of lyophilized DAR:HP- β -CD inclusion complex using <i>in vivo</i> animal model	189
4.4.7	Result and discussion	191
4.4.8	Conclusions	209
4.4.9	References	211
CHAPTER 5. BIOAVAILABILITY ENHANCEMENT OF FEBUXOSTAT		214-297
5.1	Materials	214
5.2	Instruments	215
5.3	Part-1: Formulation of Febuxostat Nanosuspension	216-265
5.3.1	Introduction	216
5.3.4	Development of FBX-NS formulation	216

5.3.3	Characterization of FBX -NS	223
5.3.4	Cell Line Studies of FBX and its formulations using Caco-2 cell line model	224
5.3.5	Pharmacokinetic evaluation of FBX -NS using <i>in vivo</i> animal	226
5.3.6	Result and discussion	228
5.3.7	Conclusion	261
5.3.8	References	263
5.4	Part-2: Formulation of Febuxostat inclusion complex with cyclodextrins	266-297
5.4.1	Introduction	266
5.4.2	Preparation of FBX inclusion complexes	266
5.4.3	Selection of Inclusion Complex	267
5.4.4	Characterization of selected Inclusion complex	268
5.4.5	Cell Line Studies of FBX and its Inclusion complex with HP- β -CD using Caco-2 cell line model	271
5.4.6	Pharmacokinetic evaluation of lyophilized FBX:HP- β -CD inclusion complex using <i>in vivo</i> animal model	273
5.4.7	Result and discussion	274
5.4.8	Conclusions	293
5.4.9	References	295
CHAPTER 6.	SUMMARY AND CONCLUSIONS	298-303
6.1	Formulation and evaluation of DAR for bioavailability enhancement	299
6.1.1	DAR Nanosuspension	299
6.1.2	DAR-Cyclodextrin inclusion complex	299
6.2	Formulation and evaluation of FBX for bioavailability enhancement	300
6.2.1	FBX Nanosuspension	300
6.2.2	FBX-Cyclodextrin inclusion complex	301
6.3	Conclusions	303
Appendix I		304