

## LIST OF TABLES

Table No.	Title	Page no.
2.1	Prevalence of COX-1 and COX-2 in different organs	23
3.1	Mean absorbance values, Regressed values and statistical data of the Calibration curve for the estimation of celecoxib in 0.1N Sodium Hydroxide	101
3.2	Optical characteristics of celecoxib in 0.1N sodium hydroxide	101
3.3	Mean absorbance values, Regressed values and statistical data of the Calibration curve for the estimation of celecoxib in methanol	102
3.4	Optical characteristics of celecoxib in methanol	102
3.5	Evaluation of accuracy and precision of the method for estimation of celecoxib in methanol and 0.1N sodium hydroxide	103
3.6	Mean absorbance values, regressed values and statistical data of the calibration curve for the estimation of celecoxib in phosphate buffer with 2.0% tween-80	107
3.7	Optical characteristics of celecoxib in phosphate buffer pH 7.4 with 2.0% tween-80	107
3.8	Evaluation of accuracy and precision of the method for the estimation of celecoxib in phosphate buffer pH 7.4 with 2.0% tween-80	108
3.9	Mean absorbance values, regressed values and statistical data of the calibration curve for the estimation of rofecoxib in methanol	110
3.10	Optical characteristics of rofecoxib in methanol	111
3.11	Evaluation of accuracy and precision of the method for estimation of rofecoxib in methanol	111
3.12	Mean absorbance values, regressed values and statistical data of the calibration curve for the estimation of rofecoxib in phosphate buffer pH 7.4 with 2.5% tween-80	114

3.13	Optical characteristics of rofecoxib in phosphate buffer pH 7.4 with 2.5% tween-80	114
3.14	Evaluation of accuracy and precision of the proposed method for the estimation of rofecoxib in phosphate buffer with 2.5% tween-80	115
3.15	Mean absorbance values, regressed values and statistical data of the calibration curve for the estimation of valdecoxib in methanol	117
3.16	Optical characteristics of valdecoxib in methanol	118
3.17	Evaluation of accuracy and precision of the method for estimation of valdecoxib in methanol	118
3.18	Mean absorbance values, regressed values and statistical data of the calibration curve for the estimation of valdecoxib in phosphate buffer pH 7.4 with 2.0% tween-80	121
3.19	Optical characteristics of valdecoxib in phosphate buffer with 2.0% tween-80	121
3.20	Evaluation of accuracy and precision of the proposed method for the estimation of valdecoxib in phosphate buffer with 2.0% tween-80	122
3.21	Mean absorbance values, regressed values and statistical data of the calibration curve for estimation of glutaraldehyde	125
3.22	Optical characteristics of solutions prepared for glutaraldehyde estimation	125
5.1	Preparation of celecoxib loaded gelatin microspheres by emulsification-solvent extraction method	151
5.2	Preparation of rofecoxib loaded gelatin microspheres by emulsification solvent extraction method	151
5.3	Preparation of valdecoxib loaded gelatin microspheres by emulsification solvent extraction method	152
5.4	Effect of tween-80 concentration on the entrapment efficiency and particle size of celecoxib loaded gelatin microspheres	155
5.5	Effect of stirring speed on the entrapment efficiency and	156

	particle size of celecoxib loaded gelatin microspheres	
5.6	Effect of composition of external phase on the entrapment efficiency and particle size of celecoxib loaded gelatin microspheres	157
5.7	Effect of volume of glutaraldehyde (GA) or formaldehyde (FA) and duration of cross-linking on the entrapment efficiency and particle size	158
5.8	Optimization of parameters for preparation of celecoxib loaded gelatin microspheres	160
5.9	Coded values of the formulation parameters of celecoxib loaded gelatin microsphere by $2^4$ factorial design	160
5.10	$2^4$ Factorial design layout of celecoxib loaded gelatin microspheres	161
5.11	Model coefficients estimated by multiple linear regression for celecoxib loaded gelatin microspheres by $2^4$ factorial design	162
5.12	Analysis of variance (ANOVA) of full and reduced models of celecoxib loaded gelatin microspheres by $2^4$ factorial design	162
5.13	Model coefficients estimated by multiple linear regression for celecoxib loaded gelatin microspheres by $2^4$ factorial design (particle size)	163
5.14	Analysis of variance (ANOVA) of full and reduced models of celecoxib loaded gelatin microspheres by $2^4$ factorial design (Particle size)	163
5.15	Effect of concentration of gelatin and concentration of span-85 on the entrapment efficiency and particle size of rofecoxib loaded gelatin microspheres	168
5.16	Effect of concentration of gelatin, concentration of span-85 on the entrapment efficiency and particle size of valdecoxib loaded gelatin microspheres	169
5.17	Effect of volume of glutaraldehyde and duration of cross-linking on the release of celecoxib from gelatin microspheres	172

5.18	Effect of volume of formaldehyde and duration of cross-linking on release of celecoxib from gelatin microspheres	173
5.19	Effect of gelatin concentration on the release of celecoxib from gelatin microspheres	175
5.20	Effect of presence of collagenase in the dissolution medium on the release of celecoxib from gelatin microspheres	176
5.21	In-vitro release profile of celecoxib loaded gelatin microspheres (fitted to peppas model)	177
5.22	Release kinetic parameters of celecoxib loaded gelatin microspheres	177
5.23	Effect of volume of glutaraldehyde and duration of cross-linking on the drug release from rofecoxib loaded gelatin microspheres	182
5.24	Effect of gelatin concentration on the release of rofecoxib from gelatin microspheres	183
5.25	In-vitro release profile of rofecoxib loaded gelatin microspheres (fitted to peppas model)	184
5.26	Release kinetic parameters of rofecoxib loaded gelatin microspheres	184
5.27	Effect of volume of glutaraldehyde and duration of cross-linking on the drug release from valdecoxib loaded gelatin microspheres	186
5.28	Effect of gelatin concentration on the release of valdecoxib from gelatin microspheres	187
5.29	In-vitro release profile of valdecoxib loaded gelatin microspheres (fitted to peppas model)	188
5.30	Release kinetic parameters of valdecoxib loaded gelatin microspheres	188
5.31	Effect of volume of glutaraldehyde (25%w/w) and duration of cross-linking on the entrapment efficiency and particle size of celecoxib loaded chitosan microspheres	200
5.32	Effect of volume of formaldehyde (37%w/w) and duration of	200

	cross-linking on the entrapment efficiency and particle size	
5.33	Effect of temperature on entrapment efficiency and particle size of the heat cross-linked microspheres	200
5.34	Effect of stirring speed on the entrapment efficiency and particle size of celecoxib loaded chitosan microspheres	201
5.35	Effect of composition of external phase on the entrapment efficiency and particle size of celecoxib loaded chitosan microspheres	202
5.36	Optimization of parameters for preparation of celecoxib loaded chitosan microspheres	203
5.37	Coded values of the formulation parameters of celecoxib loaded chitosan microsphere by $2^3$ factorial design	203
5.38	$2^3$ Factorial design layout of celecoxib loaded chitosan microspheres	204
5.39	Model coefficients estimated by multiple linear regression for celecoxib loaded chitosan microspheres by $2^3$ factorial design (entrapment efficiency)	205
5.40	Analysis of variance (ANOVA) of full and reduced models of celecoxib loaded chitosan microspheres by $2^3$ factorial design (Entrapment efficiency)	205
5.41	Model coefficients estimated by multiple linear regression for celecoxib loaded chitosan microspheres by $2^3$ factorial design (particle size)	206
5.42	Analysis of variance (ANOVA) of full and reduced models of celecoxib loaded chitosan microspheres by $2^3$ factorial design (Particle size)	206
5.43	Effect of chitosan concentration, span-85 concentration and volume of glutaraldehyde on the entrapment efficiency and particle size of rofecoxib loaded chitosan microspheres	211
5.44	Effect of chitosan concentration, span-85 concentration and volume of glutaraldehyde on the particle size and entrapment efficiency of valdecoxib loaded chitosan microspheres	213
5.45	Effect of glutaraldehyde volume and duration of cross-linking	215

	on the release of celecoxib from chitosan microspheres	
5.46	Effect of volume of formaldehyde and duration of cross-linking on the release of celecoxib from chitosan microspheres	216
5.47	Effect of temperature on the drug release of celecoxib from chitosan microspheres	217
5.48	Effect of chitosan concentration on release of celecoxib from chitosan microspheres	218
5.49	Effect of presence of collagenase in the dissolution medium on the release of celecoxib from chitosan microspheres	219
5.50	In-vitro release profile of celecoxib loaded chitosan microspheres (fitted to peppas model)	220
5.51	Release kinetic parameters of celecoxib loaded chitosan microspheres	220
5.52	Effect of volume of glutaraldehyde on the release of rofecoxib from chitosan microspheres	224
5.53	Effect of chitosan concentration on the rofecoxib release from chitosan microspheres	225
5.54	In-vitro release profile of rofecoxib from chitosan microspheres (fitted to peppas model)	226
5.55	Release kinetic parameters of rofecoxib loaded chitosan microspheres	226
5.56	Effect of volume of glutaraldehyde on release of valdecoxib from chitosan microspheres	228
5.57	Effect of chitosan concentration on release of valdecoxib from chitosan microspheres	229
5.58	In-vitro release profile of valdecoxib loaded chitosan microspheres (fitted to peppas model)	230
5.59	Release kinetic parameters of valdecoxib loaded chitosan microspheres	230
5.60	Effect of temperature on the entrapment efficiency and particle size of albumin microspheres prepared by thermal denaturation	238

5.61	Entrapment efficiency and particle size of the batches prepared using emulsification chemical cross-linking method	238
5.62	Effect of albumin concentration, span-85 concentration and volume of formaldehyde on the particle size and entrapment efficiency of celecoxib loaded albumin microspheres	240
5.63	Effect of albumin concentration, span-85 concentration and volume of glutaraldehyde on the particle size and entrapment efficiency of celecoxib loaded albumin microspheres	240
5.64	Effect of stirring speed on the entrapment efficiency and particle size of the celecoxib loaded albumin microspheres	241
5.65	Effect of composition of external phase on the entrapment efficiency and the particle size of celecoxib loaded albumin microspheres	243
5.66	Effect of concentration of bovine serum albumin, span-85 and volume of glutaraldehyde on the entrapment efficiency and particle size of rofecoxib in albumin microspheres	244
5.67	Effect of concentration of bovine serum albumin, span-85 and volume of glutaraldehyde on the entrapment efficiency and particle size of rofecoxib in albumin microspheres	245
5.68	Effect of volume of formaldehyde on the release of celecoxib from albumin microspheres	247
5.69	Effect of volume of glutaraldehyde on the release of celecoxib from albumin microspheres	248
5.70	In-vitro release profile of celecoxib loaded albumin microspheres prepared by thermal denaturation	249
5.71	Effect of presence of collagenase in the dissolution medium on the release of celecoxib from albumin microspheres	250
5.72	In-vitro release of celecoxib from bovine serum albumin microspheres (fitted to peppas model)	251
5.73	Release kinetic parameters of celecoxib loaded albumin microspheres	251
5.74	Effect of volume of glutaraldehyde on the release of rofecoxib	254

	from albumin microspheres	
5.75	In-vitro release of rofecoxib from albumin microspheres (fitted to peppas model)	255
5.76	Release kinetic parameters of rofecoxib loaded albumin microspheres	255
5.77	Effect of volume of glutaraldehyde on release of valdecoxib from albumin Microspheres	257
5.78	In-vitro release of valdecoxib from albumin microspheres (fitted to peppas model)	258
5.79	Release kinetic parameters of valdecoxib loaded albumin microspheres	258
5.80	Effect of concentration of lipid (compritol) on the entrapment efficiency and particle size	265
5.81	Effect of concentration of celecoxib on the entrapment efficiency and particle size of the nanoparticles	266
5.82	Effect of concentration of poloxamer on the entrapment efficiency and particle size of celecoxib loaded solid lipid nanoparticles	267
5.83	Effect of homogenization pressure and number of cycles on the entrapment efficiency and particle size of the celecoxib loaded solid lipid nanoparticles	268
5.84	In-vitro release of celecoxib from solid lipid nanoparticles	271
5.85	Release kinetic parameters of celecoxib loaded solid lipid nanoparticles	272
5.86	Stability study of the formulations	274
6.1	Effect of stannous chloride concentration on the labelling efficiency of CS,CMS and AMS	285
6.2	Effect of stannous chloride concentration on the labelling efficiency of SLN and GMS	285
6.3	Effect of pH on the Labelling efficiency of CS,CMS and AMS	286



6.4	Effect of pH on the labelling efficiency of SLN and GMS	287
6.5	Effect of incubation time on the labelling efficiency of CS, CMS and AMS	288
6.6	Effect of incubation time on the labelling efficiency of SLN and GMS	289
6.7	Stability of the $^{99m}\text{Tc}$ -Celecoxib (CS) and $^{99m}\text{Tc}$ -formulations (CMS, AMS, SLN and GMS) in physiological saline at 37°C	290
6.8	Stability of the $^{99m}\text{Tc}$ -Celecoxib (CS) and $^{99m}\text{Tc}$ -Formulations (CMS, AMS, SLN, GMS) in serum in-vitro at 37°C	290
6.9	Transchelation of the radiolabeled complexes with DTPA	291
7.1	Blood kinetic studies of $^{99m}\text{Tc}$ -labelled CS, CMS and AMS after intra-articular injection	299
7.2	Blood kinetic studies of $^{99m}\text{Tc}$ -labelled SLN and GMS after intra-articular Injection	300
7.3	Bio-distribution of $^{99m}\text{Tc}$ -labelled celecoxib in Sprague-Dawley rats after intra-articular administration	301
7.4	Bio-distribution of $^{99m}\text{Tc}$ -labelled celecoxib in Sprague-Dawley rats after intra-articular administration	301
7.5	Bio-distribution of $^{99m}\text{Tc}$ -labelled chitosan microspheres in Sprague-Dawley rats after intra-articular administration	302
7.6	Biodistribution of $^{99m}\text{Tc}$ -labelled chitosan microspheres in Sprague-Dawley rats after intra-articular injection	302
7.7	Bio-distribution of $^{99m}\text{Tc}$ -labelled albumin microspheres in Sprague-Dawley rats after intra-articular administration	303
7.8	Bio-distribution of $^{99m}\text{Tc}$ -labelled albumin microspheres in Sprague-Dawley rats after intra-articular administration	303
7.9	Bio-distribution of $^{99m}\text{Tc}$ -labelled solid lipid nanoparticles in Sprague-Dawley rats after intra-articular administration	304
7.10	Bio-distribution of $^{99m}\text{Tc}$ -labelled solid lipid nanoparticles in Sprague-Dawley rats after intra-articular administration	304

7.11	Bio-distribution of $^{99m}\text{Tc}$ -labelled gelatin microspheres in Sprague-Dawley rats after intra-articular administration	305
7.12	Bio-distribution of $^{99m}\text{Tc}$ -labelled gelatin microspheres in Sprague-Dawley rats after intra-articular administration	305
8.1	Knee joint diameters of the different groups before and after treatment	318
8.2	The radioactivity count ratios (A: C) in target: non-target areas in the different groups before and after treatment	319
9.1	Blood kinetic studies of $^{99m}\text{Tc}$ -labelled Celecoxib	330
9.2	Blood kinetic studies of celecoxib loaded albumin microspheres	331
9.3	Blood kinetic studies of celecoxib loaded solid lipid nanoparticles (SLN)	331
9.4	Pharmacokinetic parameters of celecoxib and its formulations	332
9.5	Biodistribution of $^{99m}\text{Tc}$ -celecoxib (CS) in Sprague-Dawley rats after intra-venous administration	333
9.6	Biodistribution of $^{99m}\text{Tc}$ -celecoxib (CS) in Sprague-Dawley rats after intra-venous administration	333
9.7	Biodistribution of $^{99m}\text{Tc}$ -Microspheres (AMS) in Sprague-Dawley rats after intra-venous injection	334
9.8	Biodistribution of $^{99m}\text{Tc}$ -Microspheres (AMS) in Sprague-Dawley rats after intra-venous injection	334
9.9	Biodistribution of $^{99m}\text{Tc}$ -solid lipid nanoparticles (SLN) in Sprague-Dawley rats after intra-venous injection	335
9.10	Biodistribution of $^{99m}\text{Tc}$ -Solid lipid nanoparticles (SLN) in Sprague-Dawley rats after intra-venous injection	335