LIST OF FIGURES

Fig. No.	Figure Title	Page No.
Fig. 1.1	TL glow curve of the natural pink quartz.	5
Fig. 1.2	Energy diagram of TL and OSL process. Different	6
	stages are involved in TL/ OSL process: (a) electron	
	and hole are created, (b) charge storage at trap and	
	(c) stimulation and light emission.	
Fig. 1.3	OSL decay curve obtained from sedimentary quartz	8
	sample.	
Fig. 1.4	Different Models for OSL (a) Simple model: one trap	12
	and one recombination center, (b) Model containing	
	competing deep trap, (c) Model involving shallow	
	competing trap, (d) Model having competing	
	recombination center.	
Fig. 2.1	Projection of alpha quartz along with its c-axis	29
	displays bigger channels of triad symmetry.	
Fig. 2.2	The binding nature of SiO4 spiral along the trigonal	30
	axis of alpha quartz.	
Fig. 3.1	Arrangement of milling jar with sun wheel.	38
Fig. 3.2	The ball motion inside the milling jar and acting	38
	force on ball.	
Fig. 3.3	Energy levels of unpaired free electron with respect	45
	to applied magnetic field.	
Fig. 4.1	Representation of average particle size and PDI of	54
	un-annealed nano synthetic quartz sample.	
Fig. 4.2	SEM image of un-annealed nano synthetic quartz	55
	sample.	
Fig. 4.3	TEM image of un-annealed nano synthetic quartz	56
	sample.	
Fig. 4.4	XRD spectra for prepared (a) un-annealed, (b) 400°C	59
	annealed, (c) 600°C annealed and (d) 1000°C	
	annealed, nano-sized samples of synthetic quartz	

Fig. 4.5	EDX image of chemically treated nano synthetic quartz sample.	60
Fig. 4.6	FTIR image of un-annealed nano-sized synthetic quartz sample	61
Fig. 4.7	UV-Visible spectra of un-annealed nano-sized synthetic quartz sample.	63
Fig. 4.8	UV-Visible spectra of prepared nano-sized synthetic quartz samples annealed at 400°C, 600°C and 1000°C.	63
Fig. 4.9	PL emission spectra of un-annealed nano-sized synthetic quartz sample.	64
Fig. 5.1	TL glow curve of unannealed NSQ for different beta doses.	70
Fig. 5.2	TL glow curve of 400°C annealed NSQ for different beta doses.	72
Fig. 5.3	TL glow curve of 600°C annealed NSQ for different beta doses.	73
Fig. 5.4	TL glow curve of 1000°C annealed NSQ for different beta doses.	74
Fig. 5.5	Average TL growth percentages for 110oC glow peak of NSQ samples annealed at 400°C, 600°C and 1000°C w.r.t. unannealed NSQ sample	76
Fig. 5.6	TL glow curve after OSL (at RT) of unannealed NSQ samples	79
Fig. 5.7	TL glow curve after OSL (at 160°C ET) of unannealed NSQ samples	80
Fig. 5.8	glow curve after OSL (at RT) of 400°C annealed NSQ samples	82
Fig. 5.9	TL glow curve after OSL (at RT) of 600°C annealed NSQ samples	83
Fig. 5.10	•	84
Fig. 5.11	TL glow curve after OSL (at 160°C ET) of 1000°C	85

	annealed NSQ samples	
Fig. 5.12	OSL Decay curve of unannealed NSQ at RT for	95
	different beta doses.	
Fig. 5.13	OSL Decay curve of 400°C annealed NSQ at RT for	98
	different beta doses.	
Fig. 5.14	OSL Decay curve of 600°C annealed NSQ at RT for	99
	different beta doses	
Fig. 5.15	OSL Decay curve of 1000°C annealed NSQ at RT for	100
	different beta doses	
Fig. 5.16	Average OSL growth percentage (at RT) of NSQ	102
	sample annealed at 400°C, 600°C and 1000°C w.r.t.	
	unannealed sample	
Fig. 5.17	Observation for average percentage loss in OSL at	107
	RT within 0 to 0.4 seconds stimulation time for NSQ	
	samples annealed at 400°C, 600°C and 1000°C	
Fig. 5.18	Observation for average percentage loss in OSL at	111
	RT within 0.4 to 100 seconds stimulation time for	
	samples annealed at 400°C, 600°C and 1000°C.	
Fig. 5.19	Observation for average percentage loss in OSL at	111
	160°C within 0.4 to 100 seconds stimulation time for	
	samples annealed at 400°C, 600°C and 1000°C	
Fig. 5.20	OSL Decay curve of unannealed NSQ at 160°C ET	115
C	for different beta doses.	
Fig. 5.21	OSL Decay curve of 400°C annealed NSQ at 160°C	117
C	ET for different beta doses.	
Fig. 5.22	OSL Decay curve of 600°C annealed NSQ at 160°C	118
C	ET for different beta doses	
Fig. 5.23	OSL Decay curve of prepared 1000°C annealed NSQ	119
<i>G</i> , - c	at 160°C ET for different beta doses	
Fig. 5.24	Observation for average percentage OSL growth at	120
	160°C of NSQ samples annealed at 400°C, 600°C	
	and 1000°C w.r.t. unannealed samples	
Fig. 5.25	Observation for average percentage loss in OSL at	122

	160°C within 0 to 0.4 seconds stimulation time for	
	NSQ samples annealed at 400°C, 600°C and 1000°C	
Fig. 5.26	ESR spectra for unannealed NSQ sample irradiated	126
	with 55Gy	
Fig. 5.27	ESR spectra for 400°C annealed NSQ sample	126
	irradiated with 55Gy	
Fig. 5.28	ESR spectra for 600°C annealed NSQ sample	127
	irradiated with 55Gy	
Fig. 5.29	ESR spectra for 1000°C annealed NSQ sample	127
	irradiated with 55Gy	
Fig. 5.30	ESR spectra for unannealed NSQ sample irradiated	127
	with 200Gy	
Fig. 5.31	ESR spectra for 400°C annealed NSQ sample	128
	irradiated with 200Gy	
Fig. 5.32	ESR spectra for 600°C annealed NSQ sample	128
	irradiated with 200Gy	
Fig. 5.33	ESR spectra for 1000°C annealed NSQ sample	128
	irradiated with 200Gy	