

	CONTENTS	PAGE NO
1	INTRODUCTION	4 - 5
2	LITERATURE REVIEW	
2.1	Iron Minerals	6
2.1.1	Thermal behaviour of iron oxides	6
2.1.2	Thermal behaviour of iron hydroxides	7- 9
2.2	Thermal Behaviour of Gangue	9- 11
2.3	Pellets and Pelletization	11- 12
2.4	Phase Change And Mineral Assimilation on Heating Iron Ores	13- 15
2.5	Sintering(Densification) of Pellets	15- 20
2.6	Reaction Kinetics	20- 21
2.6.1	Reaction rate under non isothermal condition	21- 22
2.6.2	Intergration of equation for function $f(X)$ of $(1-X)^n$	22- 23
2.6.3	Second derivate of equation	23- 24
2.7	Thermal Conductivity/Diffusivity Measurement	24- 29
2.7.1	Radial heat flow method	29- 34
2.7.2	Thermal conductivity Vs porosity	34- 39
3	EXPERIMENTAL METHODS	
3.1	Material Preparation	40.
3.1.1	Synthesis of pure iron oxide	40
3.1.2	Iron ore powder preparation	40
3.2	Powder Characterization	41
3.2.1	Size analysis	41
3.2.2	Chemical analysis	41
3.2.3	X-ray diffraction	41
3.2.4	Thermal analysis (TG/DTG/DTA)	42-43
3.2.5	Evolved gas testing	44- 45
3.2.6	True density measurement	44
3.3	Preparation of Pellet	44
3.3.1	Hand made pellet	44
3.3.2	Pelletization of ore	46
3.3.3	Pressed pellet	46
3.4	Pellet Characterization	47

		PAGE NO
3.4.1	Size measurement	47
3.4.2	Density measurement	47
3.4.3	Porosity measurement	47
3.4.4	Measurement of thermal diffusivity and conductivity	48-52
4	RESULTS AND DISCUSSION	
4.1	Characterization of Ore	53
4.1.1	Thermal analysis and x-ray diffraction	53-61
4.1.2	Quantitative phase analysis of minerals	61-71
4.1.3	Activation energy and order of reaction	71-78
4.1.4	Gangue material decomposition	78-97
4.1.5	Change in true density of iron ore	97-98
4.2	Thermal Diffusivity and Conductivity Measurement	99-135
4.2.1	Calculation of thermal diffusivity by heat balance	135-162
4.2.2	Model fitting	163-168
4.2.3	Thermal diffusivity/conductivity of pressed pellet with low porosity	168-224
5	CONCLUSIONS	225-227
	APPENDICES	228
	1 Chemical analysis of pure iron oxide	
	2 Size distribution of pure iron oxide	
	REFERENCES	229-232
	ACKNOWLEDGEMENT	