

CONTENTS

Acknowledgements	i-ii
List of figures	iii-vii
List of tables	viii
INTRODUCTION	1-12
Introduction	1
Previous work	9
Aims and objectives	9
Scope and limitation of present study	10
Organization of the thesis	11
CHAPTER 1: GEOLOGY OF THE AREA	13-30
1.1 General Geology of Aravalli Craton	13
1.2 Banded Gneissic Complex Basement	16
1.3 The Palaeoproterozoic Aravalli Supergroup Supracrustals	16
1.4 The late Palaeoproterozoic Delhi Supergrup Supracrustals	17
1.41 South Delhi Belt	
1.1.42 North Delhi Belt:	
1.5 Vindhyan Basin	20
1.6 Geology of Alwar Basin	21
1.61 Raialo Group	
1.62 Alwar Group	
1.63 Ajabgarh Group	
CHAPTER 2: PETROGRAPHY OF QUARZITE (META-ARENITES)	31-45
2.1 Introduction	31
2.2 Method of study	32
2.3 Detrital Mineralogy	33
2.31 Quartz	
2.32 Mica	
2.33 Feldspar	
2.34 Accessory Minerals	
2.4 Classification based on Dickinson'n scheme (1985)	36
2.5 Tectono Provenance	38

CHAPTER 3: SAMPLING METHODS AND GEOCHEMICAL ANALYSIS	46-52
3.1 Introduction	46
3.2 Sampling procedures	46
3.3 X-Ray Fluorescence	47
3.31 Pellets preparation	
3.32 Instrumental and operating parameters	
3.4 ICP-MS: Inductively coupled Plasma Spectrometry	48
3.41 Principal of ICP-MS	
3.42 Geological Application	
3.43 Materials and Reagents	
3.44 Sample Preparation of ICP-MS	
3.5 LOI (Loss on Ignition)	51
3.51 Procedure followed for calculating the Loss on Ignition	
CHAPTER 4: GEOCHEMICAL CHARACTERIZATION OF CLASTIC SEDIMENTARY ROCKS OF ALWAR BASIN	53-94
4.1 Introduction	53
4.2 Geochemical Data	53
4.3 Element Mobility	54
4.4 General Geochemical Characteristics of Quartzites	55
4.41 Major Elements	
4.42 Trace Elements	
4.5 General Geochemical Characteristics of Metapelites	61
4.51 Major Elements	
4.52 Trace Elements	
4.6 Multi-element Patterns	65
4.7 Enrichment Factor	69
4.8 Geochemical Variation of Stratigraphy	71
4.9 Mineral Control on Whole Rock Geochemistry and Implication	74
4.10 Influence of Heavy Mineral Accumulation	79
CHAPTER 5: SURFACE PROCESSES, WEATHERING HISTORY AND PALAEOCLIMATE	95-115
5.1 Introduction	95
5.2 Hydraulic Sorting, Recycling and Quartz Dilution	95
5.3 Source Area Weathering	101
5.4 Palaeoclimate	111
5.5 Palaeo-redox conditions	114

CHAPTER 6: PROVENANCE CHARACTERISTICS	116-135
6.1 Introduction	116
6.2 Source Characteristics	117
6.3 Location of Source Terrain	127
6.4 Provenance Modelling	132
CHAPTER 7: TECTONIC SETTING OF SEDIMENTATION IN ALWAR BASIN	136-143
7.1 Introduction	136
7.2 Tectonic Setting of Alwar Basin	136
7.3 Implication for Regional Tectonics and Continent Assembly	138
CHAPTER 8: CRUSTAL EVOLUTION AT ARCHAEOAN- PROTEROZOIC BOUNDARY	144-152
8.1 Introduction	144
8.2 Geochemical Changes across APB in Aravalli Craton	146
CHAPTER 9: SUMMARY AND CONCLUSIONS	153-159
REFERENCES	160-189