

TABLE OF CONTENTS

LEMBAR PENGESAHAN	i
TABLE OF CONTENTS	ii
LIST OF FIGURES	v
ABSTRAK	vi
ABSTRACT	vii
BAB I INTRODUCTION	1
1.1 Backgrounds	1
1.2 Problem Identification	2
1.3 Novelty	2
1.4 Objective	4
1.5 Expected Benefits	4
BAB II LITERATURE REVIEW	16
2.1 Literature Review	16
2.1.1 Low Rank Coal	16
2.1.2 Low Rank Coal Upgrading	18
2.1.3 Leaching (Chemical Demineralization)	20
2.1.4 Coal Leaching Mechanism	24
2.2 Theoretical Background	26
2.2.1 Leaching Mechanism	26
2.2.2 Techno Economic Analysis	26
2.3 Hypothesis	31
BAB III METHODS	32
3.1 Materials and Equipment	32
3.1.1 Materials	32
3.1.2 Equipment	32
3.2 Experimental variable	33
3.3 Methods	33
3.3.1 Preparations	33
3.3.2 Characterization	33



3.3.3 Leaching process.....	33
3.3.4 Analytical phase	34
BAB IV RESULT AND DISCUSSION	35
4.1 Coal Characteristics	35
4.2 Concentration Effect on Demineralization and Desulfurization.....	36
4.2.1 Nitric Acid Concentration Effect on Demineralization	36
4.2.2 Nitric Acid Concentration Effect on Desulfurization	39
4.3 Leaching time Effect on Demineralization and Desulfurization	42
4.3.1 Leaching Time Effect on Demineralization	42
4.3.2 Leaching Time Effect on Desulfurization.....	44
4.4 Effect on Moisture Content and Calorific Value of Coal.....	47
4.4.1 Effect on Moisture Content.....	47
4.4.2 Effect on Calorific Value.....	48
4.5 Techno-Economic Analysis.....	49
4.5.1 Techno Analysis	49
4.5.2 Economic Analysis.....	54
4.5.3 Product Price Estimation.....	56
4.5.4 Leaching Agent Recycle Effect.....	57
4.5.5 Solid Liquid Ratio Effect	58
BAB V CONCLUSIONS AND RECOMMENDATIONS	60
5.1 Conclusions.....	60
5.2 Recommendations.....	60
REFERENCES	1

LIST OF TABLES

Table 2.1 Different types of moisture in coal and typical methods for removal.....	16
Table 2.2 Typical characteristics of Low Rank Coals of different nation.....	17
Table 3.1. Laboratory Worksheet	32
Table 3.2 Schedule of experiment plans	34

LIST OF FIGURES

Figure 2.1 Effect of temperature for degree of demineralization	22
Figure 2.2 Effect of particle size for degree of demineralization	22
Figure 2.3 Effect of concentration for degree of demineralization.....	23
Figure 2.4 Effect of Reaction time for degree of demineralization	24
Figure 3.1 Set of Equipment	32
Figure 3.2 Research Flowchart Diagram	34