



TABLE OF CONTENT

COVER PAGE	ii
RATIFICATION PAGE	iii
STATEMENT PAGE	iv
DEDICATION PAGE	v
PREFACE	vi
TABLE OF CONTENT	vii
LIST OF FIGURES	viii
LIST OF TABLES	ix
LIST OF APPENDICES	x
ABSTRACT	xi
INTISARI	xii
CHAPTER I INTRODUCTION	1
I.1 Research Background	1
I.2 Objectives	4
I.3 Advantages	4
CHAPTER II LITERATURE REVIEW AND HYPOTHESIS	5
II.1 Literature Review	5
II.1.1 TiO ₂ as photocatalyst	5
II.1.2 Fe ₃ O ₄ /SiO ₂ /TiO ₂ nanocomposite	10
II.1.3 CO ₂ reduction	12
II.1.4 Methanol fuel	13
II.2 Hypothesis Formulation and Research Framework	14
II.2.1 Hypothesis formulation	14
II.2.2 Research framework	15
CHAPTER III EXPERIMENTAL METHOD	16
III.1 Materials	16
III.2 Equipment and instruments	16
III.3 Procedures	16
III.3.1 Synthesis of Fe ₃ O ₄	16
III.3.2 Synthesis of Fe ₃ O ₄ /SiO ₂	17
III.3.3 Synthesis of Fe ₃ O ₄ /SiO ₂ /TiO ₂	17
III.3.4 Turbidimetry method	17
III.3.5 Indirect reduction of CO ₂	17
CHAPTER IV RESULT AND DISCUSSION	18
IV.1 Synthesis of Fe ₃ O ₄	18
IV.2 Synthesis of Fe ₃ O ₄ /SiO ₂	20
IV.3 Synthesis of Fe ₃ O ₄ /SiO ₂ /TiO ₂	21
IV.4 Material Characterization	23
IV.5 Indirect Reduction	30
CHAPTER V CONCLUSION	39
V.1 Conclusion	39
V.2 Suggestion	39
REFERENCES	40
APPENDICES	45