

TABLE OF CONTENTS

COVER PAGE	i
RATIFICATION PAGE	ii
STATEMENT PAGE	iii
DEDICATION PAGE	iv
PREFACE	v
TABLE OF CONTENTS	vi
LIST OF FIGURES	viii
LIST OF TABLES	x
LIST OF APPENDICES	xi
ABSTRACT	xii
INTISARI	xiii
CHAPTER 1 INTRODUCTION	1
I.1 Background	1
I.2 Research Purposes	3
I.3 Research Benefits	3
CHAPTER II LITERATURE REVIEW AND HYPOTHESIS FORMULATION	5
II.1 Literature Review	5
II.1.1 Plastic	5
II.1.2 Polypropylene plastic	6
II.1.3 Carbon dots (CDs)	7
II.1.4 Mechanism electronic transition of carbon dots (CDs)	10
II.1.5 Synthesis of carbon dots (CDs)	13
II.1.6 Magnetite (Fe ₃ O ₄) and silica (SiO ₂)	17
II.1.7 Methylene blue	19
II.2 Hypothesis Formulation and Research Plan	19
II.2.1 Hypothesis formulation 1	19
II.2.3 Hypothesis formulation 2	20
II.2.4 Research plan	21
CHAPTER III RESEARCH METHOD	20
III.1 Materials	20
III.2 Equipment	20
III.3 Experimental Procedures	20
III.3.1 Synthesis of polypropylene carbon nanodots (PP-CNs)	20
III.3.2 Synthesis of magnetite (Fe ₃ O ₄)	21
III.3.3 Composite preparation of Fe ₃ O ₄ /SiO ₂	22

III.3.4	Photocatalyst preparation of Fe ₃ O ₄ /SiO ₂ /PP-CNs	22
III.3.5	Photocatalyst Fe ₃ O ₄ /SiO ₂ /PP-CNs activity test	22
CHAPTER IV	RESULTS AND DISCUSSION	24
IV.1	Synthesis and Characterization of PP-CNs	24
IV.1.1	Characterization with spectrophotometer UV-Visible	24
IV.1.2	Characterization with FTIR	25
IV.1.3	Characterization with spectrophotometer UV-Visible and spectrophotometer fluorescence	27
IV.1.4	Characterization with HR-TEM, SAED, EDS	30
IV.2	Synthesis and Characterization of Fe ₃ O ₄ /SiO ₂ /PP-CNs	33
IV.2.1	Characterization with FT-IR	33
IV.2.2	Characterization with XRD	36
IV.3	Photocatalyst Fe ₃ O ₄ /SiO ₂ /PP-CNs activity tests	39
IV.3.1	Effect of irradiation time variations	40
IV.3.2	Effect of photocatalyst weight variations	44
CHAPTER V	CONCLUSIONS AND SUGGESTION	46
V.1	Conclusions	46
V.1	Suggestion	46
REFERENCES		47
APPENDICES		50