

**PREPARATION OF COBALT PHOSPHATE/SILVER PHOSPHATE
VIA MICROWAVE IRRADIATION FOR PHOTODEGRADATION OF
RHODAMINE B**

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TABLE OF CONTENTS

TITLE	PAGE
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLE	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	ix
ABSTRAK	x
CHAPTER 1 INTRODUCTION	
1.1 Background of Study	1
1.2 Problem Statement	5
1.3 Objectives and Aims	6
1.4 Significance of study	7
CHAPTER 2 LITERATURE REVIEW	
2.1 Dyes Wastewater	8
2.2 Photocatalyst	12
2.2.1 Advanced Oxidation Processes (AOPs)	13
2.2.2 Photocatalysis	15
2.3 Bandgap	17
2.5 Cobalt Phosphate	20
2.6 Mechanism of Photocatalytic	21
2.6.1 Z-scheme Heterojunctions	22
2.6.2 Type II Heterojunction	24

CHAPTER 3 METHODOLOGY	
3.1 Chemicals and Materials	27
3.2 Catalyst Preparation	27
3.2.1 Synthesis of Cobalt Phosphate $\text{Co}_3(\text{PO}_4)_2$	27
3.2.2 Preparation of Silver phosphate (Ag_3PO_4)	28
3.3 Synthesis of $\text{Co}_3(\text{PO}_4)_2/\text{Ag}_3\text{PO}_4$	28
3.4 Photodegradation of RhB	29
3.5 Characterization	29
3.6 Field-emission scanning electron microscopy (FESEM)	30
3.7 UV-Vis Diffused Reflectance spectra	30
3.8 Fourier Transform Infrared (FTIR) Spectroscopy	31
3.9 Experimental designs/flow chart	32
CHAPTER 4 RESULT AND DISCUSSION	
4.1 Introduction	33
4.2 Physiochemical Properties of Photocatalysts	33
4.2.1. Fourier Transform Infrared (FTIR)	34
4.2.2. Field Emission Scanning Electron Microscope (FESEM)	35
4.2.4 Photocatalytic Activity of the $\text{Co}_3(\text{PO}_4)_2$ loaded on Ag_3PO_4	37
4.4 Parameters effecting the photocatalytic degradation	39
4.4.1 Effect of the Initial Concentration of RhB Dye	39
4.4.2 Effect on pH	41
4.4.3 Effect on Catalyst Dosage	44
4.4.4 Effect on Scavenger	45
4.5 Proposed Mechanism of Photocatalytic Degradation	47
CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS	
5.1 Conclusion	49
5.2 Recommendations	50
REFERENCES	52
APPENDICES	57
CURRICULUM VITAE	60

ABSTRACT

PREPARATION OF SILVER PHOSPHATE/COBALT PHOSPHATE VIA MICROWAVE IRRADIATION FOR PHOTODEGRADATION OF RHODAMINE B

Large amounts of water pollution are caused by the textile industry's usage of synthetic colors. Textile dyes do not bind tightly to the fabric and are discharged as effluent into the aquatic environment. Thus, the continual discharge of wastewater from a great variety of textile companies without prior treatment has serious detrimental effects on environmental quality and human health. Photocatalytic degradation is an effective destructive method to remove the dye wastewater. In this study, the synthesis of $\text{Co}_3(\text{PO}_4)_2$ with Ag_3PO_4 (CP/AP) was applied as a photocatalyst via microwave irradiation method to degrade Rhodamine B dye. The results of the prepared CP/AP were characterized using several instruments, including field emission scanning electron microscopy (FESEM), Fourier transform infrared (FTIR), and ultraviolet-visible diffuse reflectance spectroscopy (UV-Vis/DRS). The photocatalytic activity of the catalyst was observed in the degradation of Rhodamine B for 60 minutes using a 0.375 g/L catalyst. 5 CP/AP shows the highest rate (96%) > 10 CP/AP (92%) > Ag_3PO_4 (87%) > 1 CP/AP (82%) > 15 CP/AP (73%) > $\text{Co}_3(\text{PO}_4)_2$ (71%). The enhancement of the 5 CP/AP was due to the well distribution of Co and P elements on Ag_3PO_4 and narrowest band gap. Then, CP/AP was carried out for other parameters such as initial pH, catalyst dosage and concentration of RhB. The result shows the highest performance at pH 9, concentration of RhB at 10 mg/L and catalyst dosage at 0.375 g/L. Meanwhile, the scavenger study confirmed that photogenerated holes (h^+) plays a crucial role in photodegradation of RhB. Overall, the $\text{Co}_3(\text{PO}_4)_2$ on Ag_3PO_4 was successfully contribute on photoreduction of RhB under visible light.