

**CAPACITY OF RESIN IMMOBILIZED PHOTOCATALYST-
TiO₂ (RIPT-TiO₂) AND MASS DISTRIBUTION OF Cr (III)
AFTER DESORPTION PROCESS**

UNDERGRADUATE THESIS



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DEPARTEMENT OF ENVIRONMENTAL ENGINEERING
SURABAYA**

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The Author

TABLE OF CONTENTS

ACKNOWLEDGEMENT.....	i
TABLE OF CONTENTS.....	iv
LIST OF FIGURES	vii
LIST OF TABLES	ix
LIST OF APPENDIX	x
ABSTRACT	xi
CHAPTER 1 INTRODUCTION	1
1.1 Background of The Research	1
1.2 Problems of the Study	3
1.3 Objectives of the Study	3
1.4 Significance of the Study	3
1.5 Scope and Limitation.....	4
CHAPTER 2 LITERATURE REVIEW	5
2.1 Heavy Metal Pollution by Chromium	5
2.3 Photocatalysis	7
2.4 TiO ₂ Photocatalysis.....	9
2.5 <i>Resin Immobilized Photocatalyst</i> – TiO ₂ (RIPT – TiO ₂)	10
2.6 Resin Capacity.....	11
2.7 Desorption	13
2.7.1 Factors of Desorption.....	13
2.7.2 Desorbing agent	14
2.8. Mass Distribution	15
2.9 Material Functional Groups.....	16
2.10 Preliminary Research	19
CHAPTER 3 RESEARCH METHODOLOGY	21
3.1 Research Framework.....	21
3.2 Tools and Material.....	23
3.2.1 Tools and Material in Preparation of <i>Resin Immobilized Photocatalyst-TiO₂</i> (RIPT-TiO ₂)......	23

3.2.2	Tools and Material in Preparation of Cr (VI) Artificial Wastewater	23
3.2.3	Tools and Material of Photocatalysis	23
3.2.4	Tools and Material of Desorption	24
3.3	Variables	24
3.4	Research Procedure	25
3.4.1	Research Scheme	25
3.4.2	Preparation of RIPT-TiO ₂	26
3.4.3	Preparation of Artificial Cr(VI) Wastewater with a Concentration of 84.97 mg/L	27
3.4.4	Photocatalysis of Cr(VI) in Artificial Wastewater	27
3.4.5	Main Experiment	27
3.5	Data Analysis	28
3.5.1	Parameter Analysis	28
3.5.2	Functional Group and Morphological Analysis of RIPT-TiO ₂ ..	29
3.5.3	Analysis of the Resin Desorption Capacity	29
3.5.4	Mass Distribution Analysis	30
3.6	Research Schedule	31
3.7	Research Matrix	31
3.8	Research Budget Plan	34
CHAPTER 4 FINDINGS AND DISCUSSION		36
4.1	Photocatalysis	36
4.2	Desorption	37
4.2.1	Effect of Time in Chromium Desorption	37
4.2.2	Effect of Time on pH Changes	39
4.2.3	Temperature Changes during Chromium Desorption	41
4.2	Capacity of RIPT-TiO ₂ During Desorption and Photocatalysis	43
4.2.1	Desorption Capacity of Chromium	43
4.3.2	Resin Capacity in Photocatalysis After Desorption Process	45
4.4	Mass Distribution of Chromium Across Desorption Solution During Regeneration Cycles	47

4.5	Reusability of RIPT-TiO ₂ in Hexavalent Chromium Treatment.....	50
4.6	Functional Group.....	53
4.6.1	Functional Group Characteristic of Resin Anion and RIPT-TiO ₂	53
4.6.2	Comparison of FTIR Spectra for RIPT-TiO ₂ Before and After Photocatalyst	56
4.6.3	Comparison of FTIR Spectra for RIPT-TiO ₂ After Desorption Using Deionized Water	58
4.6.4	Comparison of FTIR Spectra for RIPT-TiO ₂ After Desorption Using 0.1 M Citric Acid	59
4.6.5	Comparison of FTIR Spectra for RIPT-TiO ₂ After Desorption Using 0.1 M Sulfuric Acid	60
4.6.6	Comparison of RIPT-TiO ₂ Functional Group Characteristics with Different Desorption Solution.....	61
4.7	SEM.....	63
4.7.1	Morphological Differences Between Resin and RIPT-TiO ₂	63
4.7.2	Morphological Differences of RIPT-TiO ₂ Before and After Photocatalysis.....	65
4.7.3	Morphological Differences of RIPT-TiO ₂ After Desorption Using Deionized Water.....	67
4.7.4	Morphological Differences of RIPT-TiO ₂ After Desorption Using 0.1 M Citric Acid	68
4.7.5	Morphological Differences of RIPT-TiO ₂ After Desorption Using 0.1 M Sulfuric Acid	70
CHAPTER 5 CONCLUSION AND SUGGESTION		72
5.1	Conclusion.....	72
5.2	Suggestion	73
REFERENCES.....		74
APPENDIX		

LIST OF FIGURES

Figure 2.1 Photocatalysis Mechanism.....	8
Figure 2.2 Gap Band Energy as Semiconductor	9
Figure 2.3 Crystal TiO ₂ 's Structure	9
Figure 2.4 (a) RIPT-TiO ₂ Before Contact with Wastewater (b) RIPT-TiO ₂ After Contact with Wastewater	12
Figure 2.5 Reaction of Citric Acid with Cr(III)	15
Figure 2.6 Anion Resin Functional Groups	18
Figure 3.1 Research Framework Flowchart.....	22
Figure 3.2 Tools and Material in Preparation of RIPT-TiO ₂	23
Figure 3.3 Alat dan Bahan Pembuatan Limbah Artifisial Cr (VI)	23
Figure 3.4 Tools and Material in Photocatalysis.....	24
Figure 3.5 Tools and Material in Desorption	24
Figure 3.6 Research Scheme	26
Figure 4.1 Effect of Time in Desorption Percentage of (A) RIPT-TiO ₂ and (B) Resin.....	39
Figure 4.2 Effect of Time on pH Desorption of (A) RIPT-TiO ₂ and (B) Resin.....	40
Figure 4.3 Temperature Changes Over Desorption Time of (A) RIPT-TiO ₂ and (B) Resin.....	42
Figure 4.4 Effect of Time on Desorption Capacity of (A) RIPT-TiO ₂ and (B) Resin	43
Figure 4.5 Desorption Capacity During Regeneration Cycle of (A) RIPT-TiO ₂ and (B) Resin	44
Figure 4.6 Resin Caapcity of (A) RIPT-TiO ₂ and (B) Resin	45
Figure 4.7 Cr(VI) Removal Efficiency Using (A) RIPT- TiO ₂ and (B) Resin	50
Figure 4.8 FTIR Spectra of (A Resin Anion and (B) TiO ₂	53
Figure 4.9 The Changes of FTIR Spectra for Resin and RIPT-TiO ₂	54
Figure 4.10 Fragment of the Structure of Resin Anion.....	56
Figure 4.11 Spektrum FTIR Sebelum dan Sesudah Photocatalysis	57

Figure 4.12 FTIR Spectrum After Desorption Using Deionized Water	58
Figure 4.13 FTIR Spectrum After Desorption Using 0.1 M Citric Acid	59
Figure 4.14 FTIR Spectrum After Desorption Using 0.1 M Sulfuric Acid	60
Figure 4.15 Perbandingan Spektrum FTIR Setiap Desorption Solution.....	62
Figure 4.16 Morphology of Resin and RIPT-TiO ₂	63
Figure 4.17 Morphology of RIPT- TiO ₂ Before and After Photocatalysis	65
Figure 4.18 Morphology of RIPT- TiO ₂ After Photocatalysis and Desorption Using Deionized Water.....	67
Figure 4.19 Morphology of RIPT- TiO ₂ After Photocatalysis and Desorption Using 0.1 M Citric Acid	69
Figure 4.20 Morphology of RIPT- TiO ₂ After Photocatalysis and Desorption Using 0.1 M Sulfuric Acid	70

LIST OF TABLES

Table 2.1 Preliminary Research	19
Table 3.1 Parameter Analysis Methods.....	29
Table 3.2 Research Schedule.....	31
Table 3.3 Research Matrix	31
Table 3.4 Research Budget Plan.....	34
Table 4.1 Artificial Wastewater Characteristic After Photocatalysis.....	37
Table 4.2 Mass Distribution of Chromium in Cycle Process.....	48
Table 4.3 The analysis of FTIR of Resin and RIPT-TiO ₂	54
Table 4.4 Atomic Concentration of Resin and RIPT- TiO ₂	65
Table 4.5 Atomic Concentration of RIPT- TiO ₂ Before and After Photocatalysis	66
Table 4.6 Atomic Concentration of RIPT- TiO ₂ After Photocatalysis and Desorption Using Deionized Water	68
Table 4.7 Atomic Concentration of RIPT- TiO ₂ After Photocatalysis and Desorption Using 0.1 M Citric Acid	69
Table 4.8 Atomic Concentration of RIPT- TiO ₂ After Photocatalysis and Desorption Using 0.1 M Sulfuric Acid	71

LIST OF APPENDIX

- APPENDIX A** Research Data
- APPENDIX B** Calculation
- APPENDIX C** Supporting Data

ABSTRACT

Water pollution caused by heavy metals such as chromium (Cr) is a serious environmental issue, particularly due to the toxicity of Cr(VI) compared to the less harmful Cr(III). Effective treatment methods are needed to reduce Cr(VI) and improve water quality. Resin Immobilized Photocatalyst–TiO₂ (RIPT–TiO₂) has been developed as a promising material for photocatalysis and desorption processes. This study evaluates the performance of RIPT–TiO₂ in chromium removal under optimum desorption conditions. The methodology involved variations in desorption time (50–250 minutes), desorption solutions (deionized water, 0.1 M citric acid, and 0.1 M sulfuric acid), and cycle repetitions (3 and 6 cycles). Parameters analyzed included total Cr, Cr(VI), Cr(III), pH, temperature, FTIR, and SEM. The results showed that RIPT–TiO₂ effectively removed Cr(VI) and facilitated its reduction to Cr(III). Optimum desorption conditions enhanced desorption capacity, with clear evidence of Cr(III) mass distribution. FTIR analysis confirmed functional group changes, supporting the photocatalytic and desorption mechanisms. Overall, RIPT–TiO₂ demonstrated strong potential as an immobilized photocatalyst for chromium removal in water treatment applications.

Keywords : Desorption, Hexavalent Chromium, Photocatalysis, Regeneration