

Analysis and treatment of paper industry
wastewater



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**BY
AAMIR SHEHZAD**

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SESSION: 2014-2016

**DEPARTMENT OF CHEMISTRY
SCHOOL OF SCIENCE
UNIVERSITY OF MANAGEMENT AND TECHNOLOGY,
LAHORE PAKISTAN
2016**

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

*"IN THE NAME OF ALLAH, THE BENEFICENT, THE
MERCIFUL."*

Praise is to Allah the cherisher and sustainer of the worlds...

Most gracious, most Merciful...

Master of the Day of Judgment...

Thee do we worship, and thine aid we seek...

Show us the straightway...

The way of those on whom thou has bestowed thy grace, those

Whose (portion) is not wrath. And who go not astray...

Declaration

I **Aamir Shehzad S/O Muhammad Mansha** ID: **14003140003** Session **2014-2016** hereby declare that the matter printed in thesis titled “**Analysis and treatment of paper industry waste water**” is my own work and has not been printed, published and submitted as research work, thesis or publication in any form in any University, Research institute etc. in Pakistan or Abroad.

Dated: _____

(Aamir Shehzad)



RESEARCH COMPLETION CERTIFICATE

Certified that the research work contained in this thesis titled, “**Analysis and treatment of paper industry wastewater**” has been carried out and completed by **Aamir Shehzad, ID: 14003140003**. The quantum and the quality of the work contained in this thesis are adequate for the award of Degree of MS/M.Phil.

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DEDICATED

TO

ALLAH ALMIGHTY

&

*HIS BELOVED PROPHET GREAT & IDEAL
PERSONALITY*

*HAZRAT MUHAMMAD
(P.B.U.H)*

ACKNOWLEDGEMENT

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*May **ALLAH** give them His blessings along happy life.*

AAMIR SHEHZAD

ABSTRACT

With the development of industries the environment is affected by elimination of huge amount of waste water in ponds, rivers, streams and oceans. The waste water of paper industry show alkaline nature, high levels of TDS, TSS, EC, COD and BOD, also contains toxic metals such as Lead and Zinc. This research show that the analysis and treatment of waste water of paper industry using agricultural waste (rice husk, wheat straw) and animal charcoal. The sample was collected from outlet of pulp and paper mill. The untreated waste water had pH 7.4, TDS values 1488mg/lit, EC 408 μ s/cm, TSS 720mg/lit, COD 478mg/lit and BOD 120mg/lit. The results of treated waste water were quite different than untreated wastewater. By using rice husk treatment, pH changed to 6.9, EC 241 μ s/cm, COD value to 182 mg/lit, BOD value to 61mg/lit, TDS 856mg/lit and TSS 431mg/lit. By using wheat straw treatment pH reached to 6.7 while EC 280 μ s/cm, COD 180mg/lit, BOD 82mg/lit, TDS 950mg/lit and TSS 520mg/lit. By using animal charcoal treatment pH changed up to 6.8, EC 228 μ s/cm, COD 163mg/lit, BOD 70mg/lit, TDS 707 mg/lit and TSS 380mg/lit. The results shown by animal charcoal treatment in the reducing the wastes from effluents were better than other two treatments. The elimination of Zn, Pb and Fe from waste water were studied via rice husk, wheat straw and animal charcoal treatment. The experiment was conducted by using spectrophotometer. By using rice husk treatment the percentage removal of metals was recorded as Zinc of 62%, Lead 50% and Iron 75%. By using wheat straw treatment the elimination of Zinc was observed up to 48%, Lead as 53% and Iron as 50%. By using animal charcoal treatment the percentage removing of Zinc, Lead and Iron were achieved up to 15%, 17% and 31% respectively.

CONTENTS

Acknowledgement	iv
Abstract	v
Contents	vi
List of Tables	ix
List of Figure	ix

Sr. No	DISCRIPTION	Page No
CHAPTER-1	INTRODUCTION	2
1.1:	Overview.....	1
1.2:	Introduction to paper mill.....	2
1.3:	Current status of paper industry.....	2
1.4:	Paper brands manufactured in Pakistan.....	3
1.5:	Effluents generated from paper industries.....	3
1.5.1:	Organic pollutants and suspended solids.....	4
1.5.2:	Organochlorine compounds.....	4
1.5.3:	Chlorophenolics.....	4
1.5.4:	Chemicals.....	5
1.5.5:	Dioxins and Furans.....	5
1.6:	Effluents characterization of paper industry.....	6
1.7:	Impact of effluents of paper industry on the environment.....	8
1.8:	Green Chemistry.....	8
1.9:	Analysis of waste water of paper industry.....	9
1.9.1:	pH.....	9
1.9.2:	Color.....	10
1.9.3:	Dissolved oxygen (DO).....	10
1.9.4:	Biochemical oxygen demand (BOD).....	11
1.9.5:	Chemical oxygen demand (COD).....	12

1.9.6: Total organic carbon (TOC).....	12
1.9.7: Total solids (TS).....	13
1.9.8: Turbidity.....	13
1.10: Treatment methods for waste water of paper and pulp mill.....	14
1.10.1: Physical method.....	14
1.10.2: Chemical method.....	18
1.10.3: Biological Treatment.....	21

CHAPTER-2 LITERATURE REVIEW 25

CHAPTER-3 MATERIAL AND METHODS 38

3.1: Collection of sample.....	38
3.2: Materials.....	38
3.3: Apparatus.....	38
3.4: Chemicals.....	39
3.5: Experimental procedure.....	40
3.6: Pretreatment analyses of wastewater	40
3.7: Chemical oxygen demand.....	40
3.8: Biological oxygen demand.....	41
3.9: Treatments of heavy metals of paper industry	42
3.10: Iron contents.....	42
3.11: Removal of Zn.....	43
3.12: Removal of lead.....	44

CHAPTER-4 RESULTS AND DISCUSSION 46

4.1: pH.....	47
4.2: Total suspended solids (TSS).....	48
4.3: Total dissolved solids (TDS).....	48
4.4: Electrical conductivity.....	49
4.5: Chemical oxygen demand and biological oxygen demand.....	50
4.6: Zinc and Lead.....	52

4.7: Fe.....	55
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CHAPTER-5	CONCLUSION	57
------------------	-------------------	-----------

REFERENCES	58
-------------------	-----------

LIST OF TABLES

Table No.1: Analytical results of parameters for the analysis of paper and pulp mill wastewater	48
---	----

LIST OF FIGURES

Figure No.1: Waste water produce at different phase from paper plant.....	7
Fig 2. Showing the values of parameters for pre-treatment and after treatment	46
Figure No.3: Comparative Results of pH	47
Figure No.4: Comparative Results of TSS.....	48
Figure No.5: Comparative Results of TDS.....	49
Figure No.6: Comparative Results of Electrical conductivity.....	50
Figure No.7: Comparative Results of COD.....	51
Figure No.8: Comparative Results of BOD.....	51
Figure No.13: Calibration graph of Zn for pretreatment.....	52
Figure No.14: Calibration graph of Zn for rice husk treatment.....	52
Figure No.15: Calibration graph of Zn for wheat straw treatment.....	53
Figure No.16: Calibration graph of Zn for animal charcoal treatment.....	53
Figure No.17: Calibration graph of Pb for pretreatment.....	53
Figure No.18: Calibration graph of Pb for rice husk treatment.....	54
Figure No.19: Calibration graph of Pb for wheat straw treatment.....	54
Figure No.20: Calibration graph of Pb for animal charcoal treatment.....	54
Figure No.9: Calibration graph of Fe for pretreatment.....	55
Figure No.10: Calibration graph of Fe rice husk Treatment.....	55
Figure No.11: Calibration graph of Fe for Animal charcoal treatment.....	56
Figure No.12: Calibration graph of Fe for wheat straw treatment.....	56



CHAPTER-1

Introduction

1.1: Overview

The water is a natural source that is indispensable for the whole sort of life. The water is secured the earth, yet just approximately 2.6 percent of all the water is renewed water (Gleick 1993). The 1.2 % from this water is a type of new otherwise ground water. Also the water sources flow is scattering uneven. In previous eras, an extending care around a proficient usage of water all over the place all through the biosphere, even in regions where the water need is not an issue has getting essentialness. Distinctive components that related to stress of water issuances are severer law making and greater expense.