

Analysis and treatment of fertilizer industry wastewater



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ANALYSIS AND TREATMENT OF FERTILIZER INDUSTRY WASTEWATER

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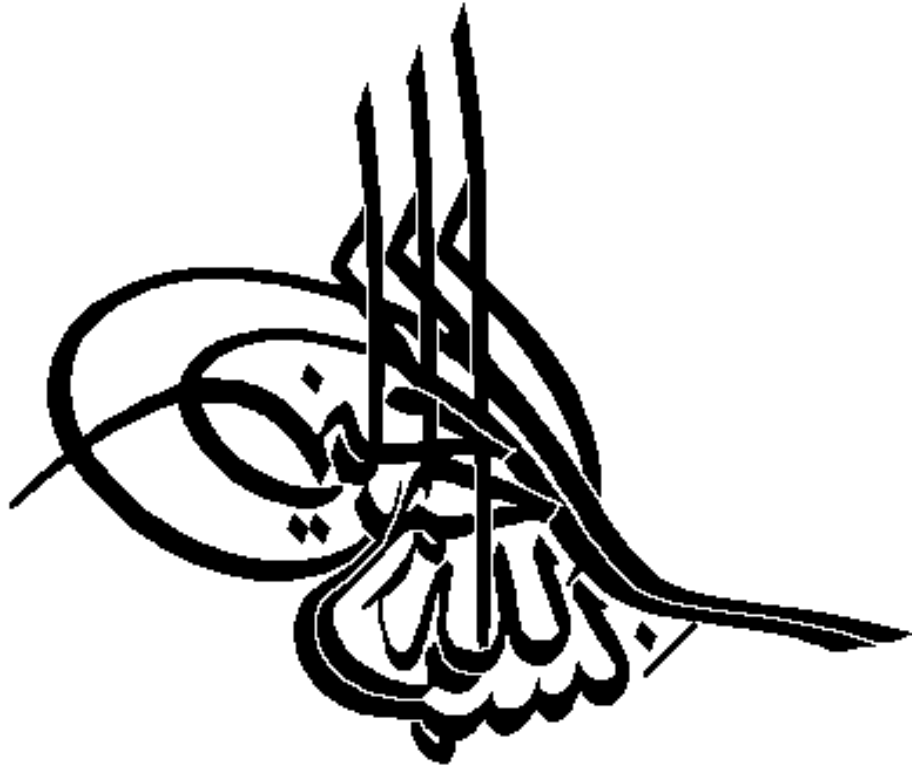
**BY
MUHAMMAD UMAIR**

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SESSION: 2014-2016

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



In the name of

Allah,

The most Compassionate,

The most merciful

Declaration

I **Muhammad Umair S/O Abdul Rehman** ID: **14003140024** Session **2014-2016** hereby declare that the matter printed in this thesis titled “**Analysis and treatment of fertilizer 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: _____

(Muhammad Umair)

RESEARCH COMPLETION CERTIFICATE

Certified that the research work contained in this thesis titled “Analysis and treatment of fertilizer industry wastewater” has been carried out and completed by **Muhammad Umair**, ID: **14003140024**. 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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DEDICATION

To my Parents

Whose devotion enchanted and lightened my

raw strives into fruitful efforts

Thanks for their great

Support and continuous care

To me, who sacrificed great.

I am really grateful to all of them.

May God bless them good health and care.

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All my praise to **Almighty Allah** the most beneficent and merciful, who enabled me to complete this thesis. I offer my deepest gratitude to the **Holy Prophet Muhammad** (Peace be upon him) whose life is forever guidance for the humanity.

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Muhammad Umair

ABSTRACT

This study is based on the analysis of the fertilizer industry wastes and their possible treatments to make it less hazardous. The single superphosphate (SSP) industry was chosen for this purpose. Samples of waste water collected from various drains of the industry. The analysis revealed that waste water contain high amounts of TDS(2340 mg/l), Ca^{2+} (2160mg/l), SO_4^{2-} (1766mg/l), PO_4^{3-} (2638mg/l) and Pb^{2+} (16mg/l). The pollutants have been successfully reduced to lower values TDS(1000mg/l), Ca^{2+} (1633 mg/l), SO_4^{2-} (1254 mg/l), PO_4^{3-} (2135 mg/l), Pb^{2+} (8 mg/l) by using wheat bagass and TDS(1600mg/l), Ca^{2+} (1186 mg/l), SO_4^{2-} (1005 mg/l), PO_4^{3-} (1884 mg/l), Pb^{2+} (12 mg/l) by using rice husk and TDS(1400mg/l), Ca^{2+} (1105 mg/l), SO_4^{2-} (969 mg/l), PO_4^{3-} (1633 mg/l), Pb^{2+} (4 mg/l) by using animal charcoal.

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CHAPTER-1

Introduction

A fertilizer is a material which may be synthetic or natural in its origin which is applied to the soil essential for the growth of plants. For the proper growth of plants sixteen elements are essential and from these essential elements fertilizers provide nitrogen, phosphorus and potassium. There were a lot of fertilizers which were known from the last hundred years. Due to demand of food production in the recent years the demand of fertilizers increased and in the year 2001 its utilization was 137 million ton.(Ramírez and Worrell 2006)