

TABLE OF CONTENTS

	<u>PAGE</u>
ACKNOWLEDGEMENT.....	i
LIST OF TABLES.....	v
LIST OF FIGURES.....	vii
1. INTRODUCTION.....	1
1.1 State of Problem.....	1
1.2 Objectives.....	2
1.3 Merits of the Thesis.....	2
1.4 Hypothesis.....	3
1.5 Literature Review.....	3
1.6 Theoretical Considerations.....	10
2. MATERIALS AND METHODS.....	20
2.1 Methods of Study.....	20
2.2 Materials.....	32
3. RESULTS.....	36
3.1 Results of Field Survey.....	36
3.2 Results of Survey of Selected Battery Factory.....	40
3.3 Results of Lead Removal Experimental Study.....	45
4. DISSCUSSION.....	55
4.1 Field Survey.....	55
4.2 Survey of Selected Battery Factory.....	56
4.3 Lead Removal Experimental Study.....	56
5. SUMMARY.....	58
6. RECOMMENDATION.....	59
7. REFERENCES.....	60
8. APPENDIX.....	64

Thesis Title : Lead Removal from Wet - Cell Battery Factory
Wastewater by Chemical Treatment
Author : Mr. Jakkris Sivadechathep
Degree : M.S. (Environmental Health)
Major Advisor : Asso. Prof. Suvit Shumnumsirivath
Project/Department : Environmental Health / Sanitary Engineering
Faculty : Public Health, Mahidol University
Date of Graduation : June 26, 1981

Abstract

This study emphasized on the evaluation and removal of lead from wet-cell battery factory wastewater, with respect to the existing conditions of battery factory processes, waste characteristics, and efficient systematic approach for the removal.

Attention had been made on three different points: 1) The existing amounts, locations, and waste characteristics of battery factories on the eastern bank of the Chao Phraya river; 2) Battery industrial processes and waste characteristics of selected factory; and 3) The pilot project study of the removal of lead was made in such a way that the effective precipitation of waste with lime under the variation of pH ranges and flocculation times could be achieved.

The results indicated that there was no significant difference of the waste characteristics among the six battery factories which have the same pasting process. However, the battery factories using the mechanical pasting process had much higher lead concentration in their wastewater than those with manual pasting. Regarding to the evaluation of waste characteristics of the selected factory, there was no variation of flows in all different processes in the factory and only the wastewater,

discharged from the pasting and charged plate washing processes contained lead contaminant. The study also showed only pH ranges had a significant effect on the removal of lead from the wastewater. The pH range of 8.5-9.0 yielded the maximum removal capacity of about 98.40 % and also showed significant from other pH ranges with $P < .01$. For the flocculation times, of 10-30 minutes, there was no different effects on lead removal both in the Jar Test and the Treatment Plant Model Studies.

Overall results obtained from this study revealed one of the effective methods for lead removal. This system is expected to be not only suitable for battery factory waste treatment but also for other lead acid waste as a wastewater treatment alternative.