

**REMOVAL OF LEAD FROM AQUEOUS SOLUTION  
USING SYNTHETIC HYDROTALCITE**

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## ABSTRACT

### REMOVAL OF LEAD FROM AQUEOUS SOLUTION USING SYNTHETIC HYDROTALCITE

Layered Double Hydroxides (LDHs) were found to have high anionic exchange capacity as removal metal cations contaminants from aqueous solution. In this study, MgAl-CO<sub>3</sub> was synthesized by using co precipitation method. Different parameters that affect the adsorption processes were studied which includes contact time, initial concentration, adsorbent dosage and initial pH. The results of contact time indicate that the maximum percentage uptake of Lead by LDHs is 42% was achieved in 420 min and for the effect of initial concentration is 92.11% was achieved in 5 ppm. The results of adsorbent dosage indicate that the maximum percentage uptake of Lead is 99.76% was achieved in 0.4 g and for the effect of initial pH is 99.31% was achieved at pH 7. percentage of uptake increase with increase in contact time, adsorbent dosage and initial pH but decrease with initial concentration. Result showed that the adsorption isotherm will fitted to a linearised form of Freundlich than Langmuir. The maximum capacity adsorbent of Frundlich is 2370 mg/g, higher than Langmuir isotherm. The characteristic of this LDHs has been done by FTIR study and showed the broad band at 3468.56cm<sup>-1</sup> due to hydrogen bond and confirm that the water are present in this LDHs sample. The characteristic study was confirmed that this LDHs is true LDHs. Adsorption experiments confirmed that LDHs was effective removal of heavy metals from aqueous solution.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Lead in the Environment

Lead is one of the common contaminants of industrial wastewaters. Lead pollution exists in aqueous waste streams of many industries such as manufacture of storage batteries, printing, painting, pigments, dyeing, leaded glass (R.L. Ramos et.al., 2002). Lead also used in food and medicinal concoctions for flavoring and sweetening. Lead is a soft, heavy, toxic and malleable poor metal and bluish white when freshly cut but tarnishes to dull gray when exposed to air. Lead is a chemical element in the periodic table that has the symbol Pb and the atomic number of lead is 82 that the highest atomic number of all stable elements.

Lead comes into water through the combustion of fossil fuels and the smelting of sulphide ore, and into lakes and streams by acid mine drainage. Lead also enters water through process industries, such as battery manufacturing and metal plating. Unlike organic compounds, lead is nonbiodegradable and accumulates in living organism, therefore, must be removed from water and wastewater (Gunay et. Al., 2006).