



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم

بسم الله الرحمن الرحيم



HANAA ALY



شبكة المعلومات الجامعية
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شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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UTILIZATION OF SLUDGE RESULTED FROM CHLORINE INDUSTRY IN WASTWATER TREATMENT

(Enviromental Chemistry Study)

Submitted By

Alaa Ibrahim Mohamed Said

*B.Sc. of Chemistry, Faculty of science, Ain Shams
Universty, (1997)*

*A Thesis Submitted in partial fulfillment
Of
The Requirement the Master Degree
In
Enviromental Sciences Chemistry*

Department Of Enviromental Basic Sciences
Institute Of Enviromental Studies And Research
Ain Shams University

Cairo – 2020

APPROVAL SHEET

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Alaa Ibrahim Mohamed Said

ABSTRACT

The purpose of this study is to check and investigate the efficiency of using the burnt brine sludge (BBS), and the non burnt brine sludge (NBBS) which resulted from chlorine industry by the chemical processing of the ultra pure brine (295-300 gm/l) which is decomposes in the electrolytic cell as low-cost solid waste adsorbents materials for the removal of the heavy metal ions like lead, cadmium and copper ions from aqueous solution. The physicochemical characteristics of each solid waste are checked and investigated by using X- ray diffraction (XRD), X-ray fluorescence (XRF), N₂ adsorption technique and scanning electron microscopy (SEM). Beside batch experiments are carried out as effect of contact time, initial pH of solution, initial heavy metal ion concentrations, adsorbent sludge dose and competition of metal ions on the adsorption of heavy metal ions was studied. Removal efficiency at optimum conditions was approximately 100% for Pb⁺², Cd⁺² and Cu⁺² (28.7, 11.2, 8.9 mg/g respectively) by using burnt brine sludge (BBS) and from 90 – 100 % for Pb⁺², Cd⁺² and Cu⁺² and from 70 – 90 % , 75 – 98 % (125.2, 18.63, 8.09 mg/g respectively) for non burnt brine sludge (NBBS). The kinetics description of adsorption for ions was followed this model (pseudo-second-order) based on amounts of heavy metal ions sorbed at different time intervals.

Keywords: Chlorine industry sludge, heavy metals, wastewater, sludge, low cost adsorbent.

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