بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

MONA MAGHRABY

ASSESSING THE USE OF LIGNIN IN THE REMOVAL OF SOME HEAVY METALS FROM INDUSTRIAL WASTEWATER IN POWER PLANTS

Submitted By

Assmaa Sayed Mostafa Mohammed
B.Sc. of Science (Microbiology/Chemistry), Faculty of Science,
Ain Shams University, 1996

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Master Degree
In
Environmental Sciences

Department of Environmental Basic Sciences
Institute of Environmental Studies and Research
Ain Shams University

2021

APPROVAL SHEET

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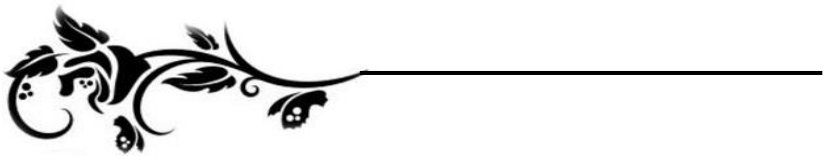
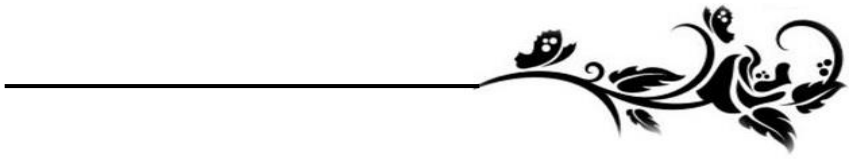


ABSTRACT



ABSTRACT

Assessing the use of lignin in the removal of some heavy metals from industrial wastewater in power plants

In this investigation, a soluble lignin derivative having an amino group was synthesized by a technique based on dry method by the reaction of isolated lignin from guava leaves with thiourea. The factors affecting the nitrogen content of the produced modified lignin mainly: reaction temperature, time and sodium hydroxide concentration besides the concentration of thiourea were studied and discussed. It was concluded that higher nitrogen content of lignin derivative is obtained at reaction temperature 120 ºC for reaction time 100 minutes. Moreover, increasing the amount of thiourea was accompanied by an increase in nitrogen content until a certain ratio. Product obtained was characterized by FT-IR, Thermo gravimetric analysis (TGA), elemental analysis (C, H, N, and S). Nevertheless, the adsorption efficiency of metal ions as Zn, Cu, Ni, Cd, Co, V and Fe was determined using atomic absorption spectrometry (AAS). The flocculation performance of the obtained modified lignin was evaluated in terms of turbidity, organic matter, total hardness and total silica. It was observed that the best clarification doses were at 26ppm ferric chloride and 4ppm modified lignin. This combined dose gives the lowest values of turbidity, total alkalinity, organic matter and total silica which changed from (18.2 NTU, 121ppm ,17.3ppm and 21.8ppm) to (0.97 NTU, 107ppm ,10.89ppm and 7.15ppm), respectively. It was found also that the modified lignin has high efficiency for removal of elements. For instance, as much as 75% of (Ni^{2+}, Zn^{2+}, Co^{2+}, Cd^{2+}, Mn^{2+}) were removed by using (8 ppm) of modified lignin, and 95% removal of (Fe and Cu).

Keywords: lignin, flocculants, water treatment, industrial wastewater, wastewater treatment; heavy metals removal; thiourea; coagulation , flocculation , Adsorption Efficiency.

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