رصد ومعالجة المخلفات السائلة الخطرة الناتجة عن صناعة مغاطس الاكريليك

رسالة مقدمة من الطالب

مصطفى محمد سيد فياض

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لاستكمال متطلبات الحصول علي درجة الماجستير

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جامعة عين شمس

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صفحة الموافقة على الرسالة

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وقد تمت مناقشة المرسالة والموافقة عليها:

اللجنة:

التوقيع

١ – ا.د/منصورة إسماعيل محمد

أستاذ الكيمياء العضوية ــ كلية البنات

جامعة عين شمس

٢ – ا.د/مصطفى محمد حسن خليل

أستاذ الكيمياء العضوية ــ كلية العلوم

جامعة عين شمس

٣ – ا.د/نادية غريب حسن قنديل

أستاذ الكيمياء العضوية ــ كلية البنات

جامعة عين شمس

٤ – ا.د/طه عبد العظيم محمد عبد الرازق

أستاذ الكيمياء البيئية ورئيس قسم العلوم الأساسية البيئية ــ معهد الدراسات والبحوث البيئية

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قسم العلوم الأساسية البيئية

تحت إشراف :-

١- ا.د/نادية غريب حسن قنديل

أستاذ الكيمياء العضوية ــ كلية البنات

جامعة عين شمس

٢- د./طه عبد العظيم محمد عبد الرازق

أستاذ الكيمياء البيئية المساعد بقسم العلوم الأساسية البيئية ــ معهد الدراسات والبحوث البيئية- جامعة عين شمس

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MONITORING AND TREATMENT OF LIQUID HAZARDOUS WASTE RESULTING FROM THE MANUFACTURE OF ACRYLIC BATHTUBS

Submitted By

Mostafa Mohame Sayed Fayad

B.Sc. of Science, Faculty of Science, Al Azhar University, 2005

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
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APPROVAL SHEET

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This thesis Towards a Master Degree in Environmental Science

Has been Approved by:

Name

Signature

1-Prof. Dr. Mansoura Ismail Mohamed
Prof. of Organic Chemistry
Faculty of Women
Ain Shams University

2-Prof. Dr. Mostafa Mohamed Hassan Khalil
Prof. of Organic Chemistry
Faculty of Science
Ain Shams University

3-Prof. Dr. Nadia Gharib Hassan Kandil
Prof. of Organic Chemistry
Faculty of Science
Ain Shams University

4-Prof. Dr. Taha Abd El Azeem Mohamed Abd El Razek
Prof. of Environmental Chemistry and Head of
Department of Environmental Basic Sciences
Institute of Environmental Studies and Research
Ain Shams University

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Under The Supervision of:

1-Prof. Dr. Nadia Gharib Hassan Kandil
Prof. of Organic Chemistry
Faculty of Science
Ain Shams University

2-Dr. Taha Abd El Azeem Mohamed Abd El Razek
Assistant Prof. of Environmental Chemistry,
Department of Environmental Basic Sciences
Institute of Environmental Studies and Research
Ain Shams University

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ABSTRACT

Bathtubs were used for hygienic purpose, nowadays they were made of acrylic polymers supported by woods base reinforced by fiber glass / polyester resin. This industry has great risk to human health and one of the most pollutant industries to the environment. The unsaturated polyester is sprayed with an organic peroxide initiator to complete polymerization. Acetone is used as a solvent to spread fiber glass for reinforcement. The present study concerned with the recovery of acetone from waste resin. Different patches of the resin waste were collected in different periods. Then for each patch the waste resin was left to separate statically at different reasonable time in closed glass bottles in order to optimize the temperature and time for the complete separation of the liquid layer containing acetone were distillated using simple distillation on water bath at 56 C°. The distillated acetone was characterized using Gas Chromatography and simple chemical reaction. The results obtained revealed that the purity of recovered acetone was 91.6% similar to the purchased acetone. The recovery of the waste acetone from the waste resin will save money of acetone purchase which has annual cost of L.E. 16,000 / Ton; however the disposal cost of the waste resin is L.E. 3,000 /Ton. Approximately amount of recovered acetone was 76.7 % from the total waste generated. The total consumption of acetone /year is 72,940 K.G which Purchasing cost is 875,280 L.E thus after apply our study we able to recovery about 49,795.20 K.G (76%), meaning that the company will buy only 23,144.80 K.G which cover all yearly Requirement from Acetone which is 72,940 K.G. thus the revenue is 796,723 L.E .The solid residue was 23.3 % from the total waste generated needs further investigation. Measurements of air contaminates (PM10, Pollutant gases, Heat stress, Noise Intensity, Light Intensity and exhaust stack emissions).The results showed that air quality in work places are within the permissible limit

according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and its executive regulation issued in 1995 and its amendments issued in 2012 and Labor Law no. 12 /2003. The Concentrations of Thoracic Particulate (PM10) are less than the maximum permissible limits according to the Environmental Law no.4/199 for Environment protection and its amendments by law No.9/2009 and its executive regulation issued in 1995 and its amendments issued in 2012 & Labor Law no. 12 /2003. (3 mg / m3) , except lamination area exceed the maximum permissible limits according to Law No. 4/94 for Environmental protection and its amendments by Law No. 9/2009 and its executive regulation issued in 2012, so worker in these areas should wear filters for dust and increase the ventilation system in these areas. The Noise level measurements in some work places exceed the permissible limit according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and its executive regulation issued in 1995 and its amendments issued in 2012 (90)dB. Therefore the company should apply the safety regulations for exposure time and the workers in these points wear ear plugs. The Heat Stress are less than the maximum permissible limits according to the Environmental Law no. 4/1994 for Environment protection and its amendments by law No.9/2009 and its executive regulation issued in 1995 and its amendments issued in 2012& Labor Law no. 12 /2003.The light intensity complying with the work law no. 12/2003The Concentration of Gases and Vapors are less than the maximum permissible limits according to the Environmental Law no. 4/1994 for Environment protection and its amendments by law No.9/2009 and its executive regulation issued in 1995 and its amendments issued in 2012& Labor Law no. 12 /2003. The Exhaust Stack emissions are less than the maximum permissible limits according to the Environmental Law no. 4/1994 for Environment protection and its

amendments by law No.9/2009 and its executive regulation issued in 1995 and its amendments issued in 2012& Labor Law no. 12 /2003.About the Hazardous & nonhazardous waste the company comply with Environmental law 4 to year 1994 which integrated by law 9 to year 2009.

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