REMOVAL OF SOME ORGANIC AND INORGANIC POLLUTANTS FROM AGRICULTURAL DRAINAGE BY USING FOAM

by

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B.Sc. Faculty of Science, Ain Shams University, 1983

Master in Environmental Science, Institute of Environmental Science.&Research,Ain Shams University,2002

A Thesis Submitted in Partial Fulfillment of The Requirements for the Doctor of Philosophy in

Environmental Science

Department of Basic Science

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رسالة مقدمة من الطالب

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ماجستير فى العلوم البيئية معهد الدراسات والبحوث البيئية جامعة عين شمس ٢٠٠٢

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موافقة مجلس المعهد **موافقة الجامعة**

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List of Abbreviations

APHA : American Public Health Association.

ATPase : Adenosine triphosphatase enzyme.

BOD : Biological oxygen demand.

BPUF : Bonded polyurethane foam.

CNS : Central nervous system.

COD : Chemical oxygen demand.

DDT : Dichloro diphenyl trichloroethane.

DO : Dissolved oxygen.

EDTA : Ethylene diamine tetraacetic acid.

EPA : Environmental protection agency.

FAS : Ferrous ammonium sulfate.

GC-ECD : Gas chromatography- electron capture detector.

HCHs : Hexachlorohexanes.

MDI : Methylene diphenyl isocyanate.

ND : Not detected.

OCPs : Organochlorine pesticides.

POPs : Persistent Organic Pollutants.

PU : Polyurethane.

PUF : Polyurethane Foam.

SBSE : Stir Bar Sorptive Extraction.

TDI : Toluene diisocyanate.

WHO : World Health Organization.

WTP : Water Treatment Plant.

γ BHC : Gamma Benzene Hexa Chloride (lindane).

Abstract

Samples of Agricultural wastewater from drains of El-Fayoum governorate were analyzed. Physical and chemical properties were done including pH, conductivity, total alkalinity; chlorides, sulfate, nitrate and ammonia, and heavy metals (iron, manganese, copper, zinc, nickel, aluminum, chromium, and lead).To assess the quality of this water as raw water for intake of water treatment plants (WTP) and evaluate the quality of drinking water produced from these WTP. Agricultural wastewater was treated by foam by two techniques (batch & column) to remove some organic and inorganic pollutants. The results showed that, in the agricultural wastewater the mean value of the electrical conductivity was ranged from 1032-2980 µmohs, pH mean value ranged from 7.4 -7.62, total alkalinity yearly average ranged from 194-285 mg/l, total hardness yearly average ranged from 260-675mg/l, chloride average ranged from 162-522mg/l. Sulphate yearly average ranged from 140-550 mg/l, nitrate ranged from 1.5 -16.3mg/l, ammonia ranged from 0.45-5.2mg/l. BOD ranged from 9.5-21.5mg/l, while COD ranged from 11.9-26.9 mg/l(more than the permissible limits according to the decree number 402/2009 by ministry of water resources and irrigation for Nile river protection). Iron ions yearly average ranged from 1.3-10.2 mg/l, manganese ions average from 59.4-230.8µg/l, aluminum ions mean ranged from 1.5-11.5 mg/l. Copper ions yearly average ranged from 5.6-22.8µg/l, zinc ions yearly mean average ranged from 32.6-62.4µg/l, chromium ions mean average ranged from 4.6-