شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

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

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

بعض الوثائق الاصلية تالفة

بالرسالة صفحات لم ترد بالاصل

٢٥٢٠

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Retention Profile and Separation of Some Textile Dyes in Natural Water Employing Polyurethane Foams and Other Extracting Agents

A Thesis Submitted to Faculty of Science- Menoufia University

by

Ahmed Talaat Ahmed Tawfik

(B.Sc. Chemistry- Tanta University)

Environmental Researcher,

Egyptian Environmental Affairs Agency,

Cabinet of Ministers

For Partial Fulfillment of the Requirements for the Degree of Master in Science in Chemistry (Inorganic Chemistry)

Supervisors

Prof. Dr. M.A. Kamel
Prof. of physical chemistry
Faculty of science
Menoufia University

Prof. Dr. M.S. El-Shahawi
Prof. of analytical chemistry
Faculty of science
Mansoura University

لجنة التحكيم

أ.د. احمد محمد مبروك الوكيل
أستاذ الكيمياء التحليلية
كلية العلوم – جامعة المنصورة

أ.د. محي الدين مصطفى العيسوى
أستاذ الكيمياء التحليلية
كلية العلوم – جامعة الإسكندرية

أ.د. مجدي عبد العظيم كامل
أستاذ الكيمياء الفيزيائية
كلية العلوم – جامعة المنوفية

أ.د. محمد سرور الشهاوي
أستاذ الكيمياء التحليلية
كلية العلوم – جامعة المنصورة

M.A. Ewaida

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا

إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

To

My Beloved Parents,

Wife and Tasneem

Contents

summary

Recently, there have been an increasing interest of textile dyes entering into our environment. Many of these dyes are hazardous to human health and to the ecosystem. One of modern man's preoccupations. Therefore, in the present thesis we present a detailed survey on the essential background information and analytical methodology on the preconcentration and degradation of textile dyes in natural water. The overall work can be summarized as follow:

i- In chapter one, a brief review on the recommended methods for the degradation and preconcentration, of textile dyes is undertaken. Special attention is given to sunlight, photolysis and gamma-radiation for the dye degradation and for minimizing the dyes in natural water. The reported literature survey revealed that few studies on the preconcentration of textile dyes employing polyurethane foams are known. Hence, there is a need for reliable rapid and low cost solid sorbent for routine work for minimizing and removal of textile dyes species in natural and industrial effluents.

ii- The second chapter is concerned with the experimental part and the capacity measurements of the polyurethane foam towards the tested textile dyes in aqueous solutions. Investigation of the various parameters involving the retention, kinetics, and sorption isotherms employing batch mode of separation and the chromatographic behavior of tested dyes are undertaken.

iii- Chapter three includes the kinetics of textile dyes onto the unloaded polyurethane foams (PUFs). The uptake of the dyes was found fast, reached equilibrium in few minutes and followed a first-order rate equation with an overall rate constant K in the range of 0.05 - 0.055 ± 0.008 min^{-1}. The dependence of the dyes uptake by polyurethane foam on the Ph, salt effect, etc., was explained in a manner consistent with a " solvent extraction " mechanism. However, the sorption data also followed Langmuir, Freundlish and Dubinin-Radushkevich (D-R) type sorption isotherms. Thus, a dual-mode

sorption mechanism involves both absorption related to " solvent extraction " and an added component for surface adsorption seems a more likely sorption mechanism model. The thermodynamic characteristics of the dyes uptake by the polyurethane foams have been studied. The positive values of ΔH an ΔS for sandolane and astrazon dyes may be interpreted as the endothermic sorption process of these dyes onto PUFs. The negative value of ΔH for other two dyes indicates that, the sorption of these dyes onto the polyurethane foam is exothermic process. The sorption and recovery percentage of the dyes from fresh, natural and industrial wastewater by the proposed unloaded foam columns were achieved quantitatively. The height equivalent (HETP), the number (N) of the theoretical plates, the breakthrough capacity and the critical capacity showed excellent performance of polyurethane foam towards the tested textile dyes. The method was successfully applied for the retention and recovery of dyes species spiked to fresh waters and underground water.