

TREATMENT OF SOME EXHAUSTED CATALYSTS USED IN METHANOL INDUSTRY

By

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B.Sc.in chemistry-faculty of science- Qatar University, 2000

A Thesis Submitted for Partial Fulfillment of
The Requirement for the The Master Degree in
Environmental Science

Department of Basic Environmental Science
Institute of Environmental Studies & Research
Ain Shams University

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معالجة عوادم بعض عوامل الحفز المستخدمة في صناعة الميثانول

رسالة مقدمة من الطالب

على محمد الهيمس المري

بكالوريوس الكيمياء-كلية العلوم-جامعة قطر-٢٠٠٠

لاستكمال متطلبات الحصول على درجة الماجستير
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بسم الله الرحمن الرحيم

"قالوا سرطانك لا علم لنا إلا ما
علمتنا إنك أنت العليم الحكيم"

صدق الله العظيم

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الدكتور / سعيد هاشم المير- مدرس بقسم الكيمياء وعلوم الاراضي- كلية العلوم والاداب - جامعة قطر -- شكراً على ما أولاه من توجيه وجهد وما قدمه للبحث العلمي من قراءة واهتمام بمسار بالبحث العلمي.

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Abstract

Chemical and physical treatment methods are described for mercury removal from spent adsorbent used to purify the natural gas before using in the methanol industry in Qatar. The physical treatment is based on thermal treatment of the waste by heating at temperatures above 400°C. Whereas treatment with strong mineral acids proves unsatisfactory (maximum mercury removal 21 %), iodine/ iodide solution (0.08M KI/ 0.01M I₂) leaches 83 % of the waste mercury content. Heating up to 400°C for four hours quantitatively removes the adsorbed mercury. The results show that the spent adsorbent contains about 1.5 ppm mercury.

A suitable location for disposal the solid waste in Qatar was investigated. From detailed Environmental Impact Assessment (EIA) studies by examining the nature of soil, underground water and climate as well as different maps of Qatar, we found that Umm Said is the best choice as a safe location of a hazardous landfill.