شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

شبكة المعلومات الجامعية

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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

HANAA ALY

CORROSION BEHAVIOR OF EGYPTIAN COIN ALLOYS IN ARTIFICIAL SWEAT

By

Ahmed Mohamed Abdelrhman Elzohry

A Thesis Submitted to the
Faculty of Engineering at Cairo University
In Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
In
Mechanical Design and Production Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis:

Corrosion Behavior of Egyptian Coin Alloys in Artificial Sweat

Keywords:
Artificial sweat, coins, corrosion, dezincification, wear

Summary:

Coins lose their original appearance, color, and clear pits may be formed on the surface. In this work, the corrosion behavior of 25-piaster (25P) and 50-piaster (50P) Egyptian coins were investigated by chemical and electrochemical techniques up to four weeks. The surface morphology of these coins were characterized by optical, scanning electron microscopy and energy dispersive X-ray analysis. The phases identification on the surface coins after four weeks were investigated by X-ray diffraction. The results declared that the rates of corrosion of 50P coins are faster than 25P coins. The investigation of the surface of these coins confirmed the presence of pits and general corrosion. A dezincification process was confirmed by atomic absorption spectroscopy for the 50P Egyptian coins. The specific wear rate of 50P Egyptian coins were more than the 25P Egyptian coins by about 3 folds while immersed in artificial sweat solution showed more increase in the wear.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the reference section.

Name: Ahmed Mohamed Abdelrhman Elzohry Date: / /

Signature:

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Nomenclature

ASS	Artificial Sweat Solution
SEM	Scanning Electron Microscopy
EDAX	Energy Dispersive X-ray
XRD	X-ray Diffraction
OM	Optical Microscopy
PS	plated steel
AAS	Atomic Absorption Spectroscopy
WL	Weight Loss
EIS	Electrochemical Impedance Spectroscopy
PP	Potentiodynamic Polarization
50P	50-piaster
25P	25-piaster