

**COPPER CORROSION INDUCED BY ACIDIC  
CONSTITUENTS IN OIL**

**NOOR AKHMAR BIN KAMARUDIN**

**FACULTY OF SCIENCE AND TECHNOLOGY  
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI  
MALAYSIA  
UNIVERSITI PUTRA MALAYSIA  
2002**



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Copper corrosion induce by acidic constituents in oil / Noor Akhmar Kamarudin.

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KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA  
21030 KUALA TERENGGANU

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(KUSTEM) C/W 1288

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**NOOR AKHMAR BIN KAMARUDIN**

PUSAT PEMBELAJARAN DIGITAL SULTANAH NUR ZAHIRAH

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**2002**

**COPPER CORROSION INDUCE BY ACIDIC CONSTITUENTS  
IN OIL**

**By**

**NOOR AKHMAR BIN KAMARUDIN**

**Thesis submitted in partial fulfilment of the requirement for the  
Degree in Bachelor of Science (Hons.)**

**Faculty of Science and Technology  
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA  
UNIVERSITI PUTRA MALAYSIA**

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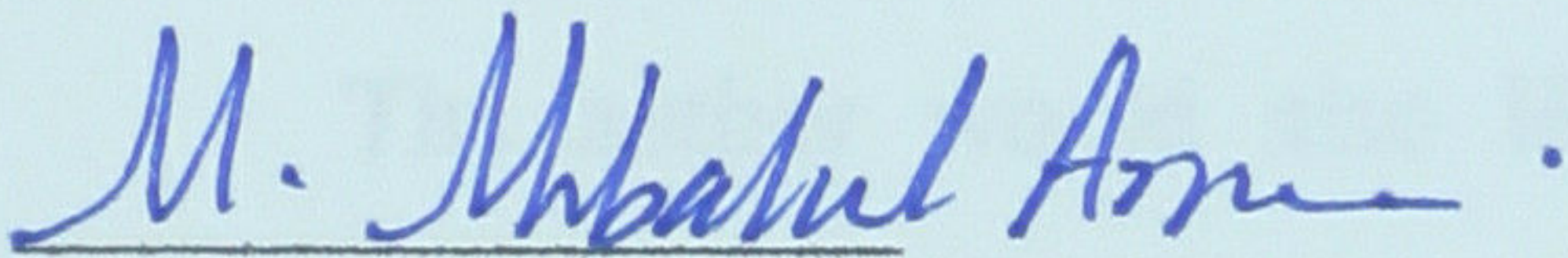
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By

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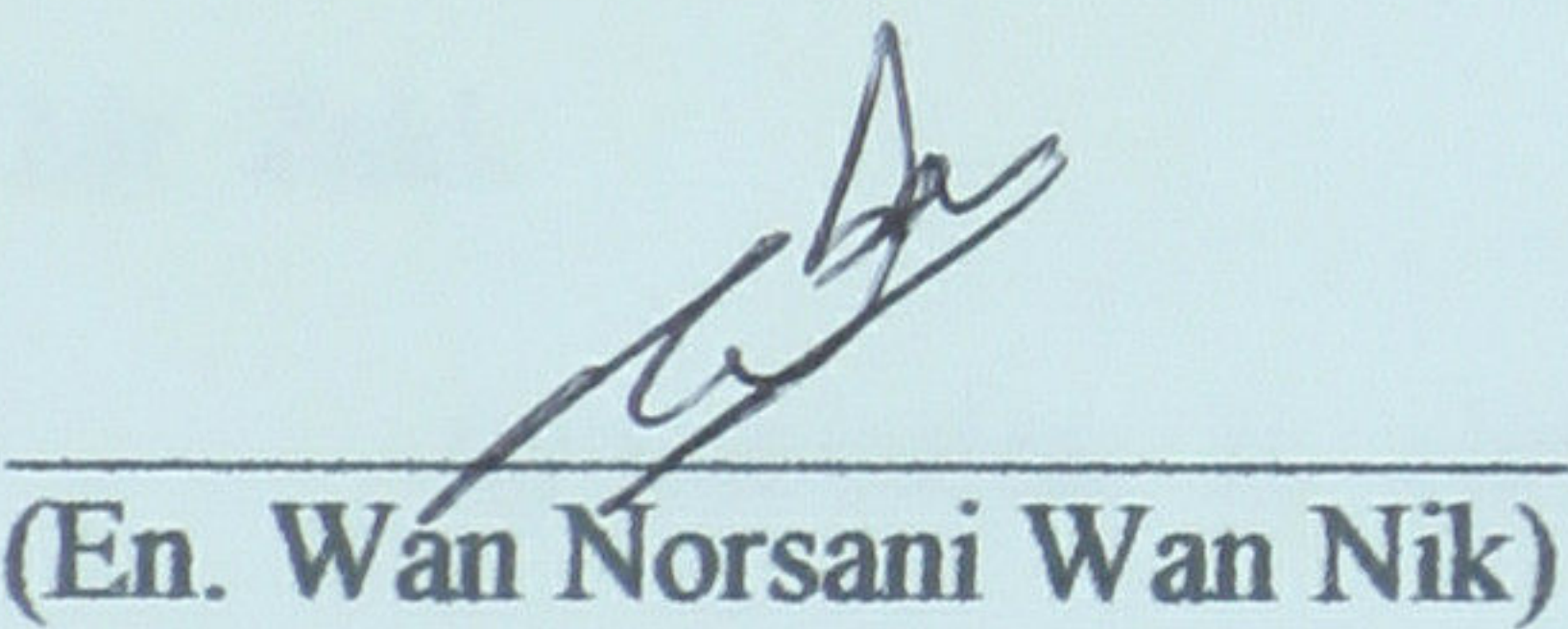
Supervisor



(Dr. Misbahul Mohd Amin)

Date : 22.06.02

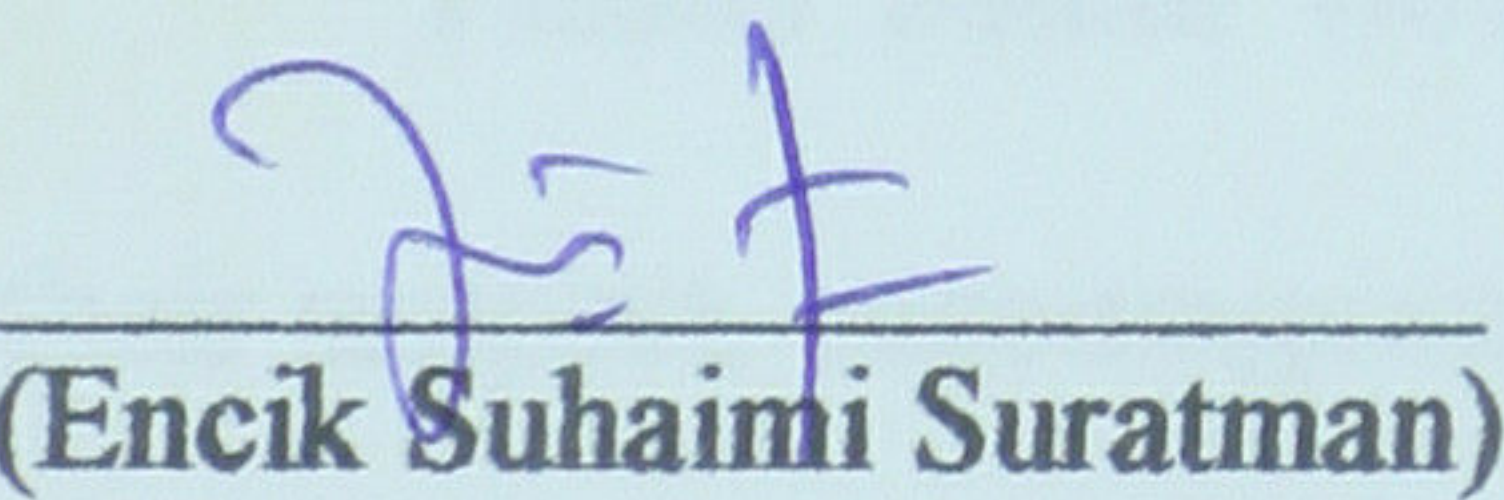
Associate Supervisor



(En. Wan Norsani Wan Nik)

Date : 23/6/02

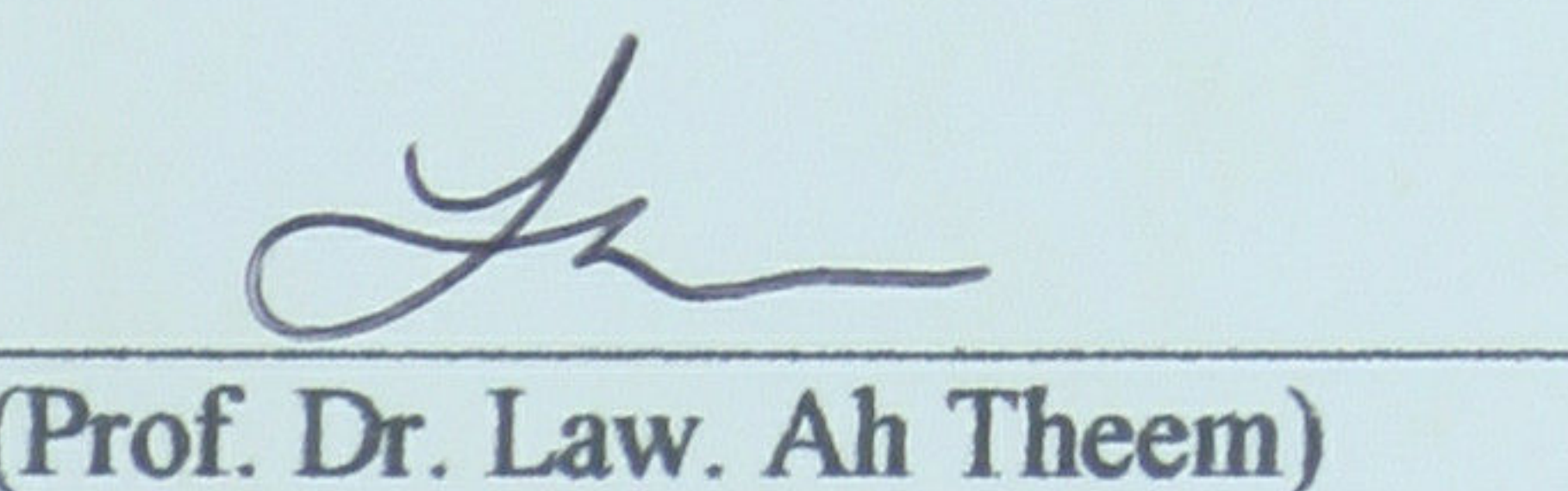
Coordinator



(Encik Suhaimi Suratman)

Date : 23/6/02

Acting As Head of Chemistry



(Prof. Dr. Law. Ah Theem)

Date : 11/7/02



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## **ABSTRACT**

Four types of oil were tested for their increase in acidity and corrosiveness against copper strip during immersion. Degradation of oil leads to formation of acidic constituents that are vital to coinage metal. In the present work, the increasing of acidity in both lubricant and palm base oil was measured using the neutralization number. Scanning electron microscope was used to examine both microstructure and corrosion formation of copper strips that were exposed for a period of times. Copper could easily form oxides salt during time of exposure and behave as a catalyst toward oil oxidation. Determined weight lost on tested strip and the increase of copper element in oil were shown to be related and could be use to predict the rate of corrosion.



## **ABSTRAK**

Empat jenis minyak telah diuji bagi menentukan pertambahan keasidan dan keupayaan untuk mengelakkan pengaratan pada logam kuprum selepas rendaman. Kerosakan minyak mengakibatkan pertambahan juzuk-juzuk berasid yang merbahaya kepada logam 'Coinage'. Di sepanjang tempoh ujian, pertambahan keasidan di dalam kedua-dua minyak pelincir dan minyak berasaskan kelapa sawit telah diuji, diukur menggunakan kaedah nombor peneutralan. 'Scanning Electron Microscope' telah digunakan bagi mengkaji kedua-dua bentuk struktur mikro logam dan pembentukan pengaratan pada kepingan logam kuprum yang telah direndam. Logam kuprum mudah teroksida untuk membentuk garam oksida dan berupaya untuk bertindak sebagai mangkin dalam pengoksidaan minyak. Menentu kehilangan berat kepingan logam yang direndam dan pertambahan unsur kuprum didalam minyak membolehkan kadar pengaratan semasa ujian ditentukan.