

DETERMINATION OF TOTAL POLYCYCLIC AROMATIC
HYDROCARBONS (PAHs) IN SOIL OFF SELECTED MAIN
ROADS IN KUALA TERENGGANU TOWN CENTER II

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in soil off selected main roads in Kuala Terengganu town center
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TESIS

**DETERMINATION OF TOTAL POLYCYCLIC AROMATIC
HYDROCARBONS (PAHs) IN SOILS OFF SELECTED MAIN
ROADS IN KUALA TERENGGANU TOWN CENTER II**

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By

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Project Coordinator

Date: 8 May 2000

(Associate Prof. Dr. Norazam Mohd. Yusoff)

**Thesis Submitted in Partial Fulfillment of the Requirement for the
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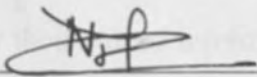
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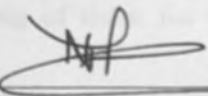
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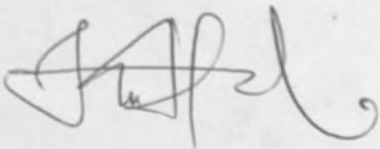
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“The most I can do for my friend is to simply be his friend”

—Henry David Thoreau

ABSTRACT

Major inputs of polycyclic aromatic hydrocarbons (PAH) into the environment have been identified by earlier researches to be from anthropogenic origins with the main source being the incomplete combustion of fossil fuels from vehicular engines. Previous studies have shown that PAHs are in fact carcinogenic and mutagenic agents. Therefore this study was undertaken to provide some baseline data on the level of PAH concentration in soils off several main roads in Kuala Terengganu town centre. PAHs were extracted from the soil matrix by Soxhlet extraction. Fractionation of hydrocarbons was carried out using a silica-alumina column and the PAH concentrations in the extracts were quantified using fluorescence spectroscopy technique. Concentrations of PAHs were found to range from 12.1 ppm to 3220 ppm (dry weight Tapis crude oil equivalent) and 9.39 ppm to 122 ppm (dry weight chrysene equivalent). Results obtained also showed that stations with heavy traffic appeared to exhibit higher PAH concentrations which seems to suggest that vehicular emissions is one of the main contributor to the PAH content in the soils investigated.

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ABSTRAK

Kajian lepas telah mengenalpasti bahawa sumber utama penjanaan polisiklik aromatik hidrokarbon (PAH) ke dalam alam sekitar adalah daripada pembakaran bahanapi fosil yang tidak lengkap dalam enjin kenderaan. Kajian-kajian lepas juga telah mendapati bahawa sebatian PAH merupakan agen karsinogen dan mutagen. Oleh itu, kajian ini dilakukan dengan tujuan untuk mendapatkan data asas berkenaan tahap kepekatan PAH dalam tanah di persekitaran jalan raya utama di bandar Kuala Terengganu. Dalam kajian ini, PAH telah diekstrak daripada matriks tanah melalui kaedah pengekstrakan Soxhlet. Pemisahan hidrokarbon dalam ekstrak pula dijalankan melalui kaedah turus kromatografi silika-alumina, manakala kandungan PAH dalam pecahan sampel ditentukan melalui teknik spektroskopi berpendafluor. Daripada keputusan yang diperolehi, kepekatan PAH didapati berada dalam julat 12.1 ppm sehingga 3220 ppm (berat kering minyak mentah Tapis setara) dan julat 9.39 ppm sehingga 122 ppm (berat kering krisena setara). Keputusan yang diperolehi telah menunjukkan bahawa stesen yang berdekatan dengan kawasan trafik yang tinggi menunjukkan nilai kepekatan PAH yang lebih tinggi. Maka, ini mencadangkan bahawa pengeluaran asap dari kenderaan mungkin merupakan salah satu daripada penyumbang utama kepada kandungan PAH dalam tanah yang dikaji.