THE DETERMINATION OF TOLUENE AND O-XYLENE IN CIGARETTE SMOKE USING SOLID PHASE MICROEXTRACTION AND GAS CHROMATOGRAPHY-MASS SPECTROMETRY DETECTOR

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JULY 2013

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Final Year Project Report Submitted in
Partial Fulfilment of the Requirements for the
Degree of Bachelor of Science (Hons.) Chemistry (Forensic Analysis)
in the Faculty of Applied Sciences
Universiti Teknologi MARA

JULY 2013

ACKNOWLEDGEMENT

In the name of Allah the most gracious and most merciful. First and foremost, I would like to show my gratitude to Allah S.W.T for giving me strength to finish my Final Year Project. Without his guidance, we are nothing in this world. Upon completion of this Final Year Project, I would like to express my gratitude to many parties who have helped me completed this project. I would like to give a heartfelt thank to my supervisor, Prof. Madya Hjh Zuraidah Binti Abdullah Munir for her guidance and thought upon completion of this project. Secondly, I would like to give my gratitude to the coordinators of this project; Miss Khairul Mazidah Binti Mohamed and Dr Mardiana Binti Saaid. I also like to thank Dr Norashikin Binti Saim, Dr Mardiana Binti Saaid and Dr Rozita Binti Osman for giving lectures on writing this proposal, presentation slide for proposal of Final Year Project and Final Year Project report. I would like to thank Mr Ahmad Kambali the laboratory assistant of Siswazah Laboratory, Mrs Nor Haida and Mr Dzahir for their willingness to teach me and help me on the operation of the GC-MS instrument. This project may not be completed if they did not give their support and guidance toward me and I like to give my highest gratitude to them for this entire hard works. Last but not least, I would like to thank my friend Muhammad Nur Mursyid Bin Mohamad Arshad for his help and not to forget my family for supporting me throughout this Final Year Project.

Mohd Naszrul Zainal

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ABSTRACT

THE DETERMINATION OF TOLUENE AND O-XYLENE IN CIGARETTE SMOKE USING SOLID PHASE MICROEXTRACTION AND GAS CHROMATOGRAPHY-MASS SPECTROMETRY DETECTOR

In this study, the concentrations of toluene and o-xylene in mainstream cigarette smoke were analysed using five cigarette smoke of different brands each. The cigarettes were labelled as C, S, L, M and D and bought around Shah Alam stores. The cigarette smoke was extracted using a solid phase microextraction (SPME) with polydimethylsiloxane (PDMS) fibre and analysed with GC-MSD. The VOCs were adsorbed onto the polymer fiber and then desorbed at the injector port for the analysis. The GC-MS used was Agilent Technologies 6890N which was equipped with fused silica capillary column and uses Helium or Nitrogen as a carrier gas. The column was HP-5 MS (30 m x 0.32 mm x 0.25 μL). The GC-MS injector port was set to 250°C and splitless mode. The column temperature was set to 90°C as initial temperature and held isothermally until the end of analysis. The flow rate of the carrier gas was set at 1.0 mL/min. From all the VOCs that were present in the mainstream cigarette smoke, only two were quantified which were toluene and o-xylene. The standard calibration curves were prepared with series of dilution ranging from 7-11 ppm for toluene and 12-20 ppm for o-xylene. The quantification of all the analytes were done by using standard calibration curves where series of dilution were done and the concentration was determined mathematically using graph. The concentration of toluene and o-xylene varied among different brands. Among the samples, brand C showed the highest concentration of toluene and o-xylene. While the lowest concentration of toluene and o-xylene was in brand S. In this research many carcinogenic compounds were also found present in the cigarette smoke.