

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

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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 μ L). 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.