

Spatial Distribution of Ambient BTEX Concentrations at an International Airport in South Africa

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Abstract : Air travel, and the use of airports, has experienced proliferative growth in the past few decades, resulting in the concomitant release of air pollutants. Air pollution needs to be monitored because of the known relationship between exposure to air pollutants and increased adverse effects on human health. This study monitored a group of volatile organic compounds (VOCs); specifically BTEX (viz. benzene, toluene, ethyl-benzene and xylenes), as many are detrimental to human health. Through the use of passive sampling methods, the spatial variability of BTEX within an international airport was investigated, in order to determine 'hotspots' where occupational exposure to BTEX may be intensified. The passive sampling campaign revealed BTEX_{total} concentrations ranged between 12.95–124.04 $\mu\text{g m}^{-3}$. Furthermore, BTEX concentrations were dispersed heterogeneously within the airport. Due to the slow wind speeds recorded (1.13 m.s^{-1}); the hotspots were located close to their main BTEX sources. The main hotspot was located over the main apron of the airport. Employees working in this area may be chronically exposed to these emissions, which could be potentially detrimental to their health.

Keywords : air pollution, air quality, hotspot monitoring, volatile organic compounds

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