

SPECIATION OF AIRBORNE VOLATILE ORGANICS IN AN INDUSTRIAL CITY IN TAIWAN

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Characteristic speciations of airborne volatile organics in Kaohsiung, the largest industrial city in Taiwan, is present in this paper. Hourly concentration of airborne volatile organic compounds (VOCs) was monitored by on-line GC/FID and 3 hours-averaged sample was parallel conducted by canister during rush hour. Field sampling works were conducted at a traffic station (Qian-Jin) and an industrial station (Lin-Yuan) during ozone episode days (October, 2003) and non-episode days (July, 2003), respectively. The dominant volatile organics species included benzene, toluene, ethylbenzene, m,p-xylene, styrene, and o-xylene. The other species were also monitored simultaneously. The concentration of airborne volatile organics at a traffic station during non-episode days were toluene (3.6~12.9 $\mu\text{g}/\text{m}^3$), styrene (0~5.8 $\mu\text{g}/\text{m}^3$), o-xylene (2.9~5.2 $\mu\text{g}/\text{m}^3$), benzene (1.4~4.9 $\mu\text{g}/\text{m}^3$), m,p-xylene (1.2~3.7 $\mu\text{g}/\text{m}^3$), and ethylbenzene (0~3.7 $\mu\text{g}/\text{m}^3$). The results in ozone episode days were toluene (30~378.8 $\mu\text{g}/\text{m}^3$), ethylbenzene (3.5~72.8 $\mu\text{g}/\text{m}^3$), m,p-xylene (0~41.3 $\mu\text{g}/\text{m}^3$), o-xylene (0~38.2 $\mu\text{g}/\text{m}^3$), benzene (0~12.9 $\mu\text{g}/\text{m}^3$), and styrene (0~9.2 $\mu\text{g}/\text{m}^3$). The concentration of airborne volatile organics at an industrial station during ozone non-episode days were toluene (2.2~6.3 $\mu\text{g}/\text{m}^3$), o-xylene (0~3.5 $\mu\text{g}/\text{m}^3$), benzene (0~2.6 $\mu\text{g}/\text{m}^3$), m,p-xylene (0~1.9 $\mu\text{g}/\text{m}^3$), and ethylbenzene (0~1.2 $\mu\text{g}/\text{m}^3$). The results of ozone episode days were toluene (39.5~679.9 $\mu\text{g}/\text{m}^3$), ethylbenzene (2.9~40.1 $\mu\text{g}/\text{m}^3$), benzene (0~21.7 $\mu\text{g}/\text{m}^3$), m,p-xylene (0~20.2 $\mu\text{g}/\text{m}^3$), o-xylene (0~19.8 $\mu\text{g}/\text{m}^3$), and styrene (0~15.2 $\mu\text{g}/\text{m}^3$). Toluene was the abundant VOCs species at these two stations. However, airborne VOCs concentration at the traffic station is higher than those at industrial station regardless of rush hour or nighttime. The results show that mobile source is the dominant impact source of airborne volatile organics at streetside station in the industrial city in Taiwan.