118

RISK CHARACTERIZATION OF ORGANIC AIR TOXICS IN AN INDUSTRIAL CITY IN TAIWAN

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Organic air toxics cause attention to the public in Taiwan since mid-1990's. This study selected benzene and toluene as the target pollutants for risk characterization in Kaohsiung, the biggest industrial city in Taiwan, by simulation. Both emissions from stationary and mobile sources are included. Risk characterization of benzene (carcinogen) and toluene (non-carcinogen) were evaluated by dispersion model (industrial source complex model) simulation and airborne exposure assessment. Cancer risk is characterized by maximum individual cancer risk (MICR) and non-carcinogen risk is characterized by hazardous index (HI). Emission estimation of benzene and toluene were approximate 4080 and 7600 ton/year, respectively. Mobile sources accounted for approximate 68 and 74 % of benzene and toluene, and the stationary sources contributed the others. The Result indicated cancer risk imposed by stack and fugitive sources were greater than target limit (10^-6). Health risk from fugitive sources is higher than the impact cause by stack, with MICR of 2908*10^-6 and 34.2*10^-6, respectively. Cancer risk resulted by benzenes from mobile sources also exceed target limit, with MICR of 355*10^-6. Non-carcinogen impacts caused by toluene indicated that the HI value was less than 0.1 for both of stationary and mobile sources. That means no significant adverse health impact effect to people. The stimulation also indicated the high risk (>100*10^-6) imposed on the vicinity of stationary source. Approximate 40% of population was exposure to the high-risk level caused by the mobile sources. However, stationary source caused a significant impact in its vicinity and was defined as a hot-spot.