

Indoor coarse and fine particulates in elementary urban schools

Abstract

The issue of more elementary children is seen to have respiratory sickness such as asthma especially the younger ones age 5-13 years old is highlighted in this research. By fact 20 - 38% of acute pediatric admissions in the country and the third most common death in children between the age of 1 and 13 are caused by respiratory illness. Children are frail during their growth because of their immature immune systems; makes them more susceptible to the health effects of air pollution compare to adults. The indoor air quality (IAQ) in classrooms plays a major role in the children health since they spend at least 71% of their time in school building, approximately seven or more hours a day in school. This research aims to assess the elementary schools IAQ profile using filter-based sampler in Kota Kinabalu, with 8 hours measurement time for total twelve sampling days. Overall, the average concentration of coarse and fine particulates in weekdays found higher compared to weekends with average PM_{0.3} $312.09 \pm 73.28 \mu\text{g}/\text{m}^3$ (weekdays) and $156.77 \pm 41.56 \mu\text{g}/\text{m}^3$ (weekends); PM_{2.0} $5.71 \pm 1.80 \mu\text{g}/\text{m}^3$ (weekdays) and $1.37 \pm 0.44 \mu\text{g}/\text{m}^3$ (weekends), and PM_{5.0} $1.45 \pm 0.68 \mu\text{g}/\text{m}^3$ (weekdays) and $0.06 \pm 0.03 \mu\text{g}/\text{m}^3$ (weekends). The I/O ratio indicates that major of the indoor airborne particulates are not generated from the outdoors but predominantly from indoor source namely from bio effluents from occupants and their activities, building materials, furnishings and ventilation rates. The importance of the study is to provide a baseline data in developing the IAQ standard for children, thus improvement for a better school facility for the children.