Assessment of Personal Level Exposures to Particulate Matter among Children in Rural Preliminary Schools as an Indoor Air Pollution Monitoring

Authors : Seyedtaghi Mirmohammadi, J. Yazdani, S. M. Asadi, M. Rokni, A. Toosi

Abstract : There are many indoor air quality studies with an emphasis on indoor particulate matters (PM2.5) monitoring. Whereas, there is a lake of data about indoor PM2.5 concentrations in rural area schools (especially in classrooms), since preliminary children are assumed to be more defenseless to health hazards and spend a large part of their time in classrooms. The objective of this study was indoor PM2.5 concentration quality assessment. Fifteen preliminary schools by time-series sampling were selected to evaluate the indoor air quality in the rural district of Sari city, Iran. Data on indoor air climate parameters (temperature, relative humidity and wind speed) were measured by a hygrometer and thermometer. Particulate matters (PM2.5) were collected and assessed by Real Time Dust Monitor, (MicroDust Pro, Casella, UK). The mean indoor PM2.5 concentration in the studied classrooms was 135µg/m3 in average. The multiple linear regression revealed that a correlation between PM2.5 concentration and relative humidity, distance from city center and classroom size. Classroom size yields reasonable negative relationship, the PM2.5 concentration was ranged from 65 to 540µg/m3 and statistically significant at 0.05 level and the relative humidity was ranged from 70 to 85% and dry bulb temperature ranged from 28 to 29°C were statistically significant at 0.035 and 0.05 level, respectively. A statistical predictive model was obtained from multiple regressions modeling for PM2.5 and indoor psychrometric parameters.

Keywords : particulate matters, classrooms, regression, concentration, humidity