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Indoor and outdoor air quality analysis for the city of Nablus in Palestine: seasonal trends of PM10, PM5.0, PM2.5, and PM1.0 of residential homes

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Abstract

Nablus city is an important urban and industrial center in the West Bank, Palestine. The topography of the city, combined with multiple sources of air pollution, creates a potential air quality problem that might affect human health. The indoor and outdoor particle concentration distributions of PM10, PM5.0, PM2.5, and PM1.0 were measured using a Grimm aerosol spectrometer from December 2014 to November 2015, at four roadsides and four urban homes in Nablus. The results of the annual averages of PM10 and PM2.5 concentrations were found to be at least three times higher than that of the European Air Quality Standards both in indoors and outdoors. The difference in the results between both the roadside and the urban areas was attributed to human and industrial activities in Nablus. The results revealed that the highest concentrations of the particulate matters are during summer, especially June and July, in the roadside areas due to heavy industrial activities during these months. The same behavior was noticed for urban areas during summer and due to other human activities. The results of indoor/outdoor (I/O) ratios were found to be less than, but very close to, 1 for both roadside and urban areas in summer and winter months. In winter times, areas with poor ventilation indicated the existence of additional sources of PM within the indoor environments, especially when smoking cigarettes and using fuel-based heaters such as fireplaces gas and kerosene heaters. © 2017, Springer Science+Business Media B.V., part of Springer Nature.

Author Keywords

Indoor/outdoor ratios; Particulate matter (PM10, PM5.0, PM2.5, and PM1.0); Roadside and urban homes; Seasonal and monthly variations