

"Gheorghe Asachi" Technical University of Iasi, Romania



ASSESSMENT OF INDOOR AND OUTDOOR PARTICULATE MATTERS IN RESIDENTIAL AREAS: THE EFFECTS OF CLIMATIC CONDITIONS AND BUILDING CHARACTERISTICS

Hatam Godini^{1,2*}, Mohammad Noorisepehr^{1,2}, Mohammad Javad Tarrahi³, Yahya Khosravi^{2,4}, Mahmoud Mohammadyan⁵

¹Department of Environmental Health Engineering, School of Health, Alborz University of Medical Sciences, Karaj, Iran

²Research Center for Health, Safety and Environment (HSE), Alborz University of Medical Sciences, Karaj, Iran

³Department of Epidemiology and Biostatistics, School of Health, Isfahan University of Medical Sciences, Isfahan, Iran

⁴Department of Occupational Health and Safety Engineering, School of Health,

Alborz University of Medical Sciences, Karaj, Iran

⁵Health Sciences Research Center, Addiction institute, Mazandaran University of Medical Sciences, Sari, Iran

Abstract

The aim of this study was to assessment of indoor and outdoor particulate matters in residential areas, and to evaluate the effects of building characteristics and climatic conditions on indoor particle concentrations. The concentration of particles was measured simultaneously indoor and outdoor air during four seasons. Information on climatic conditions and building characteristics was collected through questionnaires during the sampling period. Linear regression models were adopted for determining the relationship between the dependent variable of I/O ratio and environmental factors. The I/O ratios of PM_1 , $PM_{2.5}$, PM_4 , PM_7 , and PM_{10} were 0.67, 0.64, 0.61, 0.55, and 0.52, respectively. Moreover, the concentration of PM in the indoor air of the buildings were considerably lower than those of the outdoors (p<0.05). The results also suggest the ventilation mode and outside temperature had the most important role in the entrance of particles into the indoor environment.

Keywords: indoor air, outdoor air, outdoor temperature, particulate matters, regression model, Ventilation mode

Received: June, 2020; Revised final: September, 2020; Accepted: October, 2020

_

^{*} Authors to whom all correspondence should be addressed: e-mail: Godini_h@yahoo.com; Phone: +98 2634219689; Fax: +98 2634219689