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INDIVIDUAL EXPOSURE OF WOMEN TO FINE AND COARSE PARTICULATE MATTER

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Abstract

Individual exposure to particulate matter (PM) fractions is mainly determined by indoor source characteristics and personal activity patterns. This paper discusses experimental results obtained through the analysis of individual exposure of women to PM₁₀ and PM_{2.5}. To this purpose, 15 volunteers of different ages and lifestyles living/working in Ceccano (Italy) were selected and their exposures to PM₁₀ and PM_{2.5} were measured through a handheld photometer. They also filled out a time activity diary reporting the time spent in all the resided microenvironments and the activity performed therein in order to evaluate the influential parameters of their individual exposures. Besides, a comparison with the PM₁₀ concentration levels measured at the fixed monitoring station of the town was performed. The individual exposures were, on average, 2.7-fold higher than the fixed site monitoring concentrations, with a peak of 6.7-fold. These differences are related to the women's time activity patterns and lifestyles, as example, higher individual PM₁₀ values were measured for smokers (> 100 µg m⁻³ on daily basis). Moreover, women mainly involved in cooking activities are exposed to particle characterized by higher PM_{2.5}/PM₁₀ ratio (0.9) than the ones involved in cleaning activities. An assessment of the exposures in different resided environments was performed by evaluating the “exposure intensity”, i.e. the ratio of the daily PM exposure contribution compared to the daily time contribution. Highest exposure intensities were measured during car transportation (up to 6); exposure intensities higher than 1 were also measured at home during cooking and cleaning activities.

Key words: air pollution, fixed monitoring stations, individual exposure, particulate matter, women

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