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ASSESSMENT OF INDOOR POLLUTION IN A SCHOOL ENVIRONMENT THROUGH BOTH PASSIVE AND CONTINUOUS SAMPLINGS

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Abstract

The aim of this study is to assess indoor air quality in an educational institute located in a suburban area of the Po plain (Italy). Samplings are carried out in preschool and elementary school classrooms, and also in the garden of the institute, to have information on outdoor levels. The monitoring is performed to determine the most important indoor pollutants (i.e. volatile organic compounds (VOCs), carbonyls and NO_2), by using diffusive passive samplers. Sampling in the classrooms is undertaken only during the lessons, in order to have the evaluation of student exposition to the indoor pollutant burden. To assess seasonal variation, two campaigns are performed, one in winter and the other in spring. Alternatively in the two classrooms, real-time samplers of total VOCs and some chemical-physic parameters, such as CO and CO_2, are employed.
Results show that the classrooms are characterized by low concentration of the pollutants monitored with diffusive samplers, lower than guideline (ex. WHO) and European legislation law limits. Only limonene shows concentrations higher than European schools mean values, and in elementary classroom they are higher.
For the most of the analyzed compounds, there is a contribution of indoor source emissions, especially for aldehydes. Indoor emissions are similar in the monitored classrooms. Daily trends confirm that VOCs have mainly an indoor origin since they are similar to CO_2 ones. However, on same days the contribution of outdoor sources is important. Furthermore, on-line monitored CO_2 concentrations suggest that ventilation in the monitored rooms could be improved.

Key words: children, formaldehyde, indoor air quality, on-line detectors, and volatile organic compounds

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