The Exposure to Carbonyl Compounds in Office Buildings

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The assessment of exposure to volatile carbonyl compounds (CCs) in office buildings was the aim of this study. For investigation five large office buildings in different areas of Warsaw were selected. The identification and measurements of CCs in the working environment were carried out in fifty offices, twice in the year – in spring-summer (I round) and in autumn – winter time (II round). High performance liquid chromatography was used to determine these compounds after their derivatization to 2,4-dinitrophenylhydrazons.
Because of the absence of health based indoor air quality standards for the office working environment, in Poland and in the world, the assessment of exposure to carbonyl compounds was carried out according to standard for indoor air recommended by Seifert. Also value of Polish admissible concentration for formaldehyde established for public buildings was used.
Formaldehyde - carcinogenic agent, which is emitted from furniture, carpets as well as from glues and resins used during contraction, finishing and decoration of buildings, was detected in fifty auditing offices in I and II round. Time-averaged weighed concentrations (I round – 2.3 $\mu g/m^3$ ÷ 32.3 $\mu g/m^3$; II round – 2.0 $\mu g/m^3$ ÷ 6.6 $\mu g/m^3$) were many times lower than Polish admissible concentration - 100 $\mu g/m^3$. Instead time-averaged weighed concentrations of carbonyl compounds (without formaldehyde) in auditing offices were in the range 36.2 $\mu g/m^3$ ÷ 206.4 $\mu g/m^3$ (I round) and 11.5 $\mu g/m^3$ ÷ 51.0 $\mu g/m^3$ (II round). The measurement carried out during I round showed that the concentrations of these compounds in all offices were higher than standard – 20 $\mu g/m^3$ proposed for carbonyl compounds by Seifert.
The results of measurements of volatile carbonyl compounds in investigated offices indicated that these compounds occur in concentrations, which can influence to the sick building syndrome at workers.

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