Abstract

A study on the preventive management of health effects and regulation strengthening for indoor air quality in office

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Indoor air quality (IAQ) is a major concern to business and employee especially office workers, because it might impact the health, comfort and productivity. According to previous studies, improved indoor air quality can result in higher productivity and fewer lost work days. And many building materials contain hazardous substances such as formaldehyde and TVOCs (total volatile organic compounds), and these substances may cause the health effects such as sick building syndrome (SBS), which have irritation of eye, some allergic asthmatic syndromes and a variety of low-level symptoms as well as impact comfort and productivity for office workers. According to data from the National Statistical Office in Korea, the number of office workers has been increasing year after year from 2005. Since indoor air quality in office buildings could be important portion, it is required to manage indoor air quality in office buildings.

Meanwhile, only limited indoor air quality data of office buildings have been reported in Korea. We therefore conducted a serious of field investigations in office buildings to assess the exposure of indoor air pollutants for office workers.

In this study, air pollutants in indoors and outdoors were simultaneously measured in three kinds of offices, which were offices in the metropolitan area, national industrial complex, and workplace detached office from factory in company site boundary. Target air pollutants were carbon monoxide(CO), carbon

dioxide (CO2), ozone (O3), nitrogen dioxide (NO2), TVOCs, formaldehyde (HCHO), airborne bacteria, and fine particle (PM10). Office characteristics. And health effects were surveyed by using of questionnaire. A total of 328 employees participated in this questionnaire survey with 31 offices. Average concentrations of measured indoor air pollutants did not exceed the indoor air quality guidelines (IAQGs) by Ministry of Employment and Labor. However, indoor and outdoor ratio (I/O) values was greater than 1 for CO2, HCHO, and TVOCs, indicating that those pollutants was emitted in office indoors. The measured average concentrations of target air pollutants in three kinds of offices did not shown significant difference. According to the surveyed questionnaires, 47.4% of employees answered their reduced working capacity owing to ventilation deficiency, and 35% of employees answered their reduced working capacity owing to indoor air quality.

The office workers have spent most of their times in office building. Even though the indoor air pollutants concentrations measured in this study did not exceed the indoor air quality guidelines, office workers were dissatisfied the indoor air quality of offices and some workers had health effects. These results can be explained that further researches in relation to indoor air quality of office building should be needed as well as factory work place.

Key words : indoor air quality, office building, office worker, exposure assessment, health effects