

Abstract

A Comparison of Methyl and Gaseous Elemental Mercury in the Urban Atmosphere

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This study was carried out to compare the levels of mercury species, i.e., elemental mercury (Hg^0) and methyl mercury (MeHg), in indoor and outdoor air in urban areas in Canada. Offices, laboratories for undergraduate studies, and laboratories for research, in a public building located in the downtown core of the city of Toronto, were selected. Hg^0 was measured using an automated mercury vapour analyzer. MeHg in the air was collected using a carbotrap, and the trapped MeHg was thermally desorbed and analyzed using a CVAFS. The results showed that both indoor MeHg and Hg^0 levels were related to location function and air circulation. Outdoor MeHg levels were significantly elevated, ranging between 21 and 41% of total mercury (THg) levels, compared to those reported from previous studies. Outdoor Hg^0 fluctuations were not found to be significantly related to temperature or sunlight exposure, and outdoor MeHg levels were connected to soil and vegetation abundance. Average indoor Hg^0 levels were found to be between 1.4 and 15 times higher than outdoor levels, whereas MeHg indoor levels were not consistently higher than outdoor levels. Although the mercury concentrations in the indoor environment are still lower than the safety standard for Hg^0 and organic mercury, they are comparable to those observed near point sources. Thus, indoor air can be a source of mercury to the atmosphere.