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Long-Term Monitoring and Seasonal Analysis of PM10-Bound Benzo(a)pyrene in the Ambient Air of Northwestern Hungary

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Abstract : Atmospheric aerosols have several important environmental impacts and health effects in point of air quality. Monitoring the PM10-bound polycyclic aromatic hydrocarbons (PAHs) could have important environmental significance and health protection aspects. Benzo(a)pyrene (BaP) is the most relevant indicator of these PAH compounds. In Hungary, the Hungarian Air Quality Network provides air quality monitoring data for several air pollutants including BaP, but these data show only the annual mean concentrations and maximum values. Seasonal variation of BaP concentrations comparing the heating and non-heating periods could have important role and difference as well. For this reason, the main objective of this study was to assess the annual concentration and seasonal variation of BaP associated with PM10 in the ambient air of Northwestern Hungary seven different sampling sites (six urban and one rural) in the sampling period of 2008–2013. A total of 1475 PM10 aerosol samples were collected in the different sampling sites and analyzed for BaP by gas chromatography method. The BaP concentrations ranged from undetected to 8 ng/m3 with the mean value range of 0.50-0.96 ng/m3 referring to all sampling sites. Relatively higher concentrations of BaP were detected in samples collected in each sampling site in the heating seasons compared with non-heating periods. The annual mean BaP concentrations were comparable with the published data of the other Hungarian sites.

Keywords : air quality, benzo(a)pyrene, PAHs, polycyclic aromatic hydrocarbons
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