ABSTRACT

The diploma thesis deals with the determination of sources of polycyclic aromatic hydrocarbons (PAH) and the changes in the PAH concentrations during the last 11 years, from 2006 to 2016. The data were sampled at National Atmospheric Observatory in Košetice, a representative station for the Central European Region. Multidimensional statistical methods as Positive Matrix Factorization (PMF), conditional bivariate probability function (CBPF), and Potential Source Contribution Function (PSCF) were used for data analyses.

In the first part, the changes in concentrations of the four specific PAH, Benzo(a)pyrene (BaP), Fluoranthene (FLA), the sums of all the PAH (SUMA), and the Toxical Equivalent (TEQ) was studied. The highest concentration of all four specific PAH was detected at the beginning of the studied period. The immission limit for BaP was not exceeded. Statistically significant decreasing trend for BaP, TEQ, and SUMA PAH was identified.

Second part of the thesis studied the PAH source apportionment. The study proved that the station was strongly influenced by the local domestic heating on one hand, and long-distance transportation from the west, and specifically from the northwest on the other hand. The influence of long-distance transport has an increasing trend over time, vice-versa for the household influence. The study also confirmed that the majority of the PAH at NAOK comes from the combustion sources.

Key words: PAH, PMF, source apportionment