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POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) SAMPLED IN AEROSOL PHASE AT DIFFERENT SITES OF THE WESTERN PYRENEES IN NAVARRA (SPAIN)

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Abstract

The concentrations of 15 selected polycyclic aromatic hydrocarbons (PAHs) were determined in daily PM10 samples collected at a rural site, an urban site and a traffic site in Navarra during 2009. PAHs were extracted by microwave-assisted extraction (MAE) from the corresponding quartz filters and later analyzed by gas chromatography/mass spectrometry (GC/MS). An intensive annual study was enabled with this analytical procedure as turnover is multiplied by 50 with MAE in comparison with the classical extraction technique (Soxhlet). The annual average total concentrations of the 15 target compounds ranged from 0.6 ng m^{-3} to 1.2 ng m^{-3} at the rural and traffic sampling stations respectively, showing up to four times higher PAHs concentrations in winter than in summer. When compared to other European cities, Pamplona registered significantly lower PAHs values. Other pollutants like NOx, CO and PM10 were found to be well correlated with PAHs, and O_3 presented a negative correlation. The results of diagnostic ratios and principal component analysis (PCA) revealed the high influence of diesel and gasoline emissions in the three studied areas, although, other main sources were also found.

Key words: air quality; diagnostic ratio; PM10; polycyclic aromatic hydrocarbons (PAHs); principal component analysis

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