Distribution characteristic and sources apportionment of polycyclic aromatic hydrocarbons(PAHs) in the Songhua River drainage basin, Northeast China

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The Songhua River drainage basin, which is one of China's seven major rivers basins, is located in northeast China. The Songnen Plain is one of the most important agricultural region of China. It is important to research and assess the pollution of PAHs in this rivers basins. Totally 54 river water samples (20 from the mainstreams, 34 from the tributaries) were collected together with 13 samples from other types of water (rainwater, groundwater, sewage, stream and lake water).This study reports the PAHs characterization in the main streams of Songhua River, the 2nd Songhua River, Nen River and their major tributaries. The 16-PAHs identified as priority pollutants by the USEPA, were detected.

The 16 PAHs in water and suspended particulate matter (SPM) in the Songhua River drainage basin were identified and quantified by gas chromatography mass spectrometry (GC/MS). The total PAHs concentration ranged from 0.41 to 128.7μg/g (dry weight) in SPM and 13.9 to 305.5 ng/L in surface water, respectively. Low-ring PAHs (including two and three rings PAHs) were dominant in all PAHs samples. The results showed a positive correlation between the total PAH concentrations both in water and SPM with TOC content. When compared with other river systems around the world, the concentrations of PAHs in Songhua River drainage basin were lower, and some rivers of this basin showed some PAHs contamination. Identification of the emission sources based on PCA and diagnostic ratios suggested the pyrogenic sources were the most important contribution to PAHs in the study area. The result of the ecological risk assessment shows little negative effect for most individual PAHs in the water of the Songhua River drainage basin.

(1)Khalili, N. R., Scheff, P. A., Holsen, T. M., et al.(1995). *Atmospheric Environment*, 29(4), 533-542.