

Background concentrations of PAH:s in precipitation and air in Finland

In the atmosphere, the organic fraction includes a large variety of compounds, which originate from both natural and anthropogenic emissions.

Polycyclic aromatic hydrocarbons (PAH-compounds) are a particularly harmful part of the organic fraction due to their carcinogenic effect on humans.

In this study, PAH-compounds from particulate matter in air (PM₁₀ -samples) and monthly rainwater samples were collected in Kuhmo and Virolahti, Finland. The Kuhmo sampling station is situated in a rural district of central-eastern Finland, and Virolahti is located in south-eastern Finland, near Russian border.

Rainwater samples were collected into teflon bags using a standard rainwater sampler, from April 2007 to March 2008. PM₁₀-samples were collected onto teflon filters, on spring 2008 at Kuhmo, and 2007-2008 at Virolahti. After collecting, samples were analyzed in the FMI's Air Chemistry Laboratory.

The results clearly show that average concentrations of PAH-compounds in rainwater and PM₁₀-fraction are highest in winter. During winter, there are more PAH-sources due to heating. PAH-compounds decompose in photochemical reactions, which act as a sink for these compounds. These reactions are slower in the wintertime, when there is less light, compared to summertime when there is lots of light. The average monthly PAH-deposition in Kuhmo is 3300 ng m⁻², and the spring mean PAH-concentration in PM₁₀-fraction is 1.1 ng m⁻³. When comparing PM₁₀ PAH-concentrations in Kuhmo to the ones measured in Virolahti in southern Finland, it is clearly shown that mean concentration in Kuhmo is lower. At Virolahti, mean PAH-concentration in spring 2007 was 4.1 ng m⁻³.

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