

LOCAL DISTRIBUTION AND ACCUMULATION OF POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) IN THE ARCTIC SNOW COVER, BARENTSBURG, WESTERN SPITSBERGEN

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The study of polycyclic aromatic hydrocarbons in the upper snow cover was conducted in small mining town Barentsburg located at Spitsbergen archipelago. Specific climate and orographic conditions as well as distance from major PAH sources make Barentsburg ideal for assessment of local anthropogenic contamination. The study was focused on short-termed distribution of PAHs rather than accumulation in snow cover. Upper snow cover contained PAHs of local pyrogenic and petrogenic origin. In dependence of sampling site location prevailed one of them. Total concentration of PAHs in both dissolved and particulate fractions ranged within town from 63.72 ng/L along cargo road to 578.51 ng/L near the coal combustion power plant. In the mixture of PAHs phenanthrene was dominant in both aquatic form and bonded with particulate matter. This compound is quite stable and is released during non-complete coal combustion as well as by diesel/gasoline combustion by snowmobiles and autos. Heavier compounds, like dibenzo[*a,h*]anthracene and benzo[*a*]anthracene were found only bound to particulate matter in concentrations of 15.83-43.43 ng/L and 12.97-90.51 ng/L of meltwater correspondingly. The main areas of their distribution are coal storage and power plant. Small amounts of particulate benzo[*a*]pyren were found in snow of scooter parking areas and near power plant. Others pollutants, as acenaphthylene having high photochemical reactivity, are apparently transformed into others compounds in short time and not detectable at all. For areas, almost restricted from the local influence of PAH pollutants (background areas) selected PAHs levels did not exceed detection limits.