VARIABILITY OF AIRBORNE FINE DUST CONCENTRATIONS AND CONTENT OF PAHs IN PM2.5 – MEASUREMENTS IN CZĘSTOCHOWA, POLAND

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Summary

The paper presents measurement results of two airborne dust fractions concentrations: the fine (PM2.5, the particles with the aerodynamic diameter up to 2.5 μm) and coarse dust (PM2.5–10, particles of diameter between 2.5 and 10 μm) at a measuring site in Częstochowa. Both fractions of dust were sampled in 24 h cycles during whole 2005 year, from January to December. The dust was collected with the use of a sequential, two channel air sampler (Dichotomous Partisol-Plus Model 2025, Ruprecht and Patashnik Co.) with the PM10 head and PM2.5 separator (sharp cut cyclone). The following polycyclic aromatic hydrocarbons (PAHs) were determined in the samples of PM2.5: fluoranthene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenzo(a,h)anthracene and benzo(g,h,i)perylene. The experiment proved an elevated annual concentration of PM2.5 (32.3 μg/m^3) and annual concentration of PM10 exceeding the standard (46 μg/m^3). High concentrations of PAHs in PM2.5 were noted; in winter they were 3–5 times higher than in summer. The annual benzo(a)pyrene concentration was 3.9 μg/m^3, i.e. almost 4 times the future target value for EU countries.