

Genotoxicity of size segregated aerosol

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A cellular assay of calf thymus DNA coupled with ^{32}P -postlabelling was used to study the genotoxic potential of organic compounds bound onto particles of various aerodynamic diameters collected in the Czech Republic during winter period of 2009. Coarse (10-1 micrometer), fine (1-0.5 micrometer), and condensational (0.5 – 0.17 micrometer) aerosol fractions were sampled by BGI_900 HiVol sampler at four sampling sites. The sites were positioned in Prague center, near highway, in background and at small settlement in proximity to industrial complexes/open cast coal mine. Aerosol mass size distributions corresponded to the site position. About 50% of total aerosol masses were found in coarse fraction for the small settlement and Prague center while in background and the highway sites coarse particles accounted for 25% and 32 % of total aerosol mass respectively. Fine/condensational fractions dominated at the highway (48%/ 26%) and background (43%/25%) sites while formed about 35%/10% and 35%.16% at the small settlement and Prague respectively. Total aerosol mass were not alarmingly high during the measured period. Campaign-average concentrations of aerosol mass were the highest at the small settlement (27 micrograms/m³) lower in Prague and the highway site (about 18 micrograms/m³) and the lowest values were in background site (10 micrograms/m³). Samples collected on the polyurethane foam (PUF) were extracted by dichloromethane and analyzed for the content of carcinogenic polycyclic aromatic hydrocarbons (c-PAHs). The genotoxic potential of extracts was measured by ^{32}P -postlabelling analysis of DNA adducts. Nuclease P1 was used for adduct enrichment. The labelled DNA adducts were resolved by two-directional thin layer chromatography. The radioactivity of distinct adduct spots was measured by liquid scintillation counting. The study was supported under the project SP/1a3/149/08 of the Ministry of the Environment of the Czech Republic.