

Source Apportionment and Genotoxicity of Size Segregated Aerosol. JAN HOVORKA (1), Jan Topinka (1,2), Jiri Krouzek (1), Philip K. Hopke (3), (1) *Charles University in Prague*, (2) *Institute of Experimental Medicine ASCR, Prague*, (3) *Clarkson University, Potsdam*

Aerosol genotoxicity is usually determined for PM size-integrated samples. Such approach in principle does not allow specifying dependency of aerosol genotoxicity on particle size and also lowers resolution power of aerosol source reconnaissance techniques. Method of aerosol genotoxicity determination is thoroughly discussed, also in relation to polycyclic aromatic hydrocarbon (PaH) concentrations, in another our study presented at the conference. In this contribution, genotoxicity of organics extracts from aerosol of coarse (1.0-10 micro-meter) accumulation (0.50-1.0 micro-meter) and condensational mode (0.17-0.50 micro-meter) sampled by HiVol cascade impactor were related to likely aerosol sources. Sampling campaign went during winter 2009 for 18 days consecutively at four sites in the Czech Republic. The sites were Prague center, small settlement in highly industrialized area, proximity to highway and background in a large forested area. Highly time-resolved data of aerosol size distributions, gaseous components and meteorology recorded concurrently with HiVol sampling at each site were used to apportion aerosol sources. Coarse fraction exhibited lowest genotoxicity per fraction mass, in comparison with smaller sizes, and showed low inter-site variability. Fugitive dust sources dominated coarse aerosol fraction at all the sites. Similarly, genotoxicity of accumulation mode particles did not vary significantly among the sites but was, as per fraction mass, near two-fold than in coarse mode. Contrary to coarse and accumulation modes, genotoxicity of condensational mode particles was the highest and varied significantly among the sites. There was near two-fold genotoxicity at the small settlement in comparison with other sites. The settlement site is under the impact of emissions from nearby coal power stations. Surprisingly, Prague and highway sites influenced by emission from mobile combustion sources did not exhibit significantly higher values of genotoxicity as per size fraction mass. Supported by the Czech Ministry of the Environment (grant #SP/1a3/149/08).