CHARACTERIZATION OF NANOPARTICLES IN OSTRAVA URBAN AEROSOL

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Abstract

The Ostrava city and its suburbs have been rightfully considered the localities with unsatisfactory environment in the long term. Comparing the number of days during which the immission limit of PM10 daily concentration can be exceeded - 35 days/year with the real situation, which is about 6 times worse and evidence of significant health effects related to polluted air in Ostrava population illustrate importance of situation. That’s the reason the scientists in Ostrava region concentrate on source apportionment determination in PM10, PM2.5 and ultrafine fraction of airborne aerosol and discuss the contribution of industrial emission sources and local heating combustion emissions. It is expected that in the winter season just local heating plays an important role in atmospheric pollution. There are various types of materials burned like biomass, black coal or even worse material, including brown coal, coal sludge or plastic waste in local heating. Contribution of transportation and re-suspended particles is also important. The matter of nanoparticles can play a meaningful role in this process. In this work we present results of nanoparticles characterization conducted under different meteorological conditions at four locations in Ostrava: Ostrava-Poruba, which is considered to be a suburb with a relatively low pollution level, Ostrava-Přívoz, close to the city centre and the coking plant, Ostrava - Mariánské Hory and Ostrava-Bartovice considered to be the most polluted locality in the region. The concentration, size distribution, morphological properties of particles with respect to metals content and PAH’s bounced on particles were measured and on-line monitored using FMPS spectrometer, NanoID sampler, ICP-MS, HPLC and SEM microscopy. Discussion of results is presented.

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