



Investigation on Aerosol particles originating from asphalt pavement using Wideband Integrated Bioaerosol Sensor and Optical Particle Counter

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Asphalt related emissions act as non-traditional sources of secondary organic aerosol precursors (Khare, 2018). We have evaluated emissions generated during asphalt pavement construction and compared it to background and laboratory measurements. Particle size distribution during construction, background and laboratory measurements were performed with an Optical Particle Counter (OPC) and correlated with a Wideband Integrated Bioaerosol Sensor (WIBS). Fluorescence intensity of aerosol particles of both background measurements and during the pavement construction process were recorded with two excitation wavelengths (280 nm and 370 nm) and two emission windows (310 - 400 nm and 420 - 650 nm). The multi-channel registration of aerosol particles allows a differentiation between asphalt emissions, soot and biological particles and provides information on the concentration and signature of asphalt aerosol particles.

Laboratory studies on the same asphalt mixture were set up to provide particle size and fluorescence information on the asphalt emission without the influence of environmental impacts. Fluorescence excitation and emission spectra of the applied asphalt mixture support the assignment of aerosol particles registered by the WIBS to asphalt origin.

Literature:

- Khare, D. R. Gentner, Considering the future of anthropogenic gas-phase organic compound emissions and the increasing influence of non-combustion sources on urban air quality. *Atmos. Chem. Phys.* 18, 5391–5413 (2018).