

## Pavement type influence on particulate matter composition

R. Licbinsky<sup>1</sup>, D. Durcanska<sup>2</sup>, V. Adamec<sup>1</sup>, J. Huzlik<sup>1</sup>

<sup>1</sup>Transport Research Centre, Lisenska 33a, 636 00, Brno, Czech Republic

<sup>2</sup>Faculty of Civil Engineering, University of Zilina, Komenskeho 52, 01026, Zilina, Slovakia

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Particulate matters (PM) are an actual part of research not only due to increasing concentrations in the ambient air but primarily because of their negative effects on human health (respiratory and cardiovascular diseases). 347,900 European died in accordance with the EU study (Watkiss et al., 2005) due to air pollution. Especially in the large cities PM can be a problem due to the road transport that is an important source of these particles.

Two localities were chosen for active PM sampling (LECKEL MVS6) to determine the differences in the PM concentrations and chemical composition near roads with different pavements. The first locality represents highway near town Zilina with stone mastic asphalt pavement (SMA) and approximately 20,000 vehicles per day. Second one is the part of Zilina town circuit with asphalt concrete pavement (AC) and approximately 14,000 vehicles per day. PM<sub>10</sub>, PM<sub>2.5</sub> and PM<sub>1.0</sub> concentrations using gravimetric analysis (Mettler-Toledo MX5/A) of each exposed filter were measured and the content of selected metals (ICP/MS, Agilent 7500ce) and polyaromatic hydrocarbons (GS/MS, Shimadzu QP2010) were determined. Meteorological conditions and current traffic intensity were also observed during the sampling campaigns. The first sampling campaign took place in July 2008, the second one in October 2008.

It is assumed that inorganic particles originate purely because of cement concrete pavement abrasion. Thus these particles also represent 90 % of particles from asphalt pavement abrasion (Snilsberg et al., 2007) and their main content is in the coarse PM fraction. The share of this coarse fraction on overall PM<sub>10</sub> concentrations was higher on the locality with AC pavement (town circuit road) determined during both sampling campaigns. PM<sub>1.0</sub> fraction was dominant in both campaigns on locality next to highway with SMA pavement. These results indicate higher production of coarse PM fraction due to abrasion of AC pavement. Selected metals contents that represent some source connected with particle mechanical separation such as Zn, Sb, Cu, Ba and others were determined in both coarse and fine PM fractions.

PM<sub>2.5</sub> fraction was also observed using different methodology to determine the content of polyaromatic hydrocarbons. These results will also be presented in this paper.

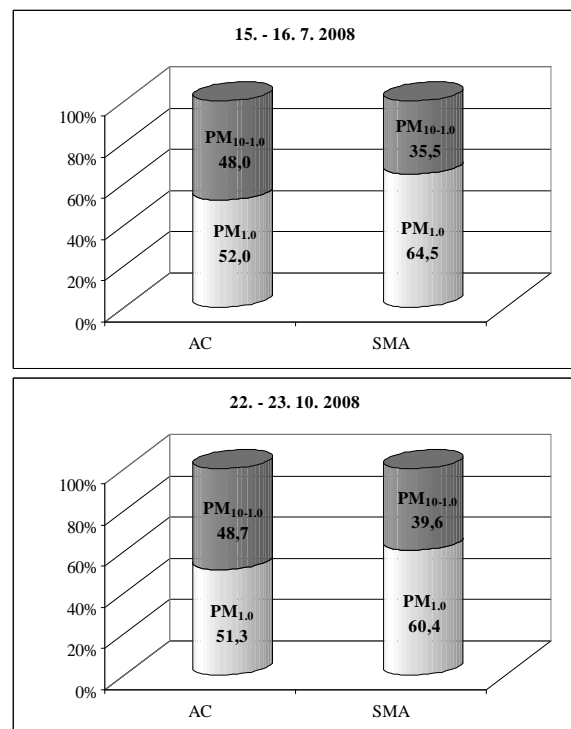


Figure 1. The share of PM fractions

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