

# ANALYSIS OF DUSTS FROM VEHICLE EXHAUST WITH THE USAGE OF THE ELECTRON MICROSCOPY

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The vehicle fuel as the product of petrochemical industry is one of atmospheric dust source. Research carried on dusts emitted from diesel fuels proved negative influence on human health, on animals and plants as well as on other environmental elements [1,2]. Content of dust particles, their size, long duration time, their range and mobility, all have great influence on harmful and dangerous dust particles character.

The aim of the paper was morphological analysis of dusts sourced from three different vehicle with high performance engines. Truck vehicles with large high performance engines were chosen for the studies. According to the literature high contribution of solid particles content sourced from exhaust of these type of vehicles are reported. Samples were collected in the outlet of vehicle exhaust-pipe, in the distance of 5-15 cm, after vehicle engine heating process to the working temperature. The engine worked on neutral gear. Dust images were made with the usage of transmission electron microscopy (TEM). Three types of particles were noticed: irregular shape particles, spherical particles and agglomerates of very fine particles (mostly soot). The following morphological parameters were taken from electron microscopic images of dust through computer analysis: surfaces areas, length, width, circuit, Feret's diameter, supplementary diameter, circularity, extension ratio of width to length were defined in the paper. Comparing obtained results we can state that particles with the smallest diameter (0,205  $\mu\text{m}$ ) were present in exhaust of Iveco truck. Inconsiderably larger diameter (0,209  $\mu\text{m}$ ) was specified for particles collected from MAN truck exhaust. While dust diameters taken from Jelcz truck, were mainly 0,1  $\mu\text{m}$  bigger (0,305  $\mu\text{m}$ ) from previous ones. Altogether we can state that dusts analyzed from all vehicles are in the range of 0,1 up to 0,2  $\mu\text{m}$ , thus can enter respiratory human truck.

1. M. Riedl, D. Diaz-Sanchez, *Biology of diesel exhaust effects on respiratory function, J Allergy Clin Immunol*, 2005, 115, 221-228.
2. M. Matti Maricq, *Chemical characterization of particulate emissions from diesel engines: A review, Aerosol Sci*, 2007, 38, 1079 – 1118.