

**Nanoparticles from road vehicle exhaust.
An artifact or a reality?**

Topics for a Round Table Discussion

Scientific studies show a link between particulate matter (PM) (alone or in combination with other pollutants in the air) and a series of health effects, suggesting higher social cost of air pollution. Based on this suggestion, governments and international organizations are setting limitations on atmospheric PM mass concentration (air quality standards) and are promulgating reductions in particle emissions from the key sectors. In urban areas where traffic is concentrated, PM concentration is reaching high levels, mainly caused by motor vehicles.

Current and proposed emission standards for motor vehicles employ a mass metric as emission quantification criterion. Properties such as number and size as well composition are not measured on legislative basis due to the complexity of the matter and uncertainties inherent to the characterization procedures. However, in considering the next steps, regulators are posing the question what property of atmospheric aerosol is responsible for the toxic effects and, therefore, whether a more cost-effective solution would be necessary to regulate purely the toxic component.

In this framework, the key questions would appear to be:

1. What is the influence of PM chemical composition on the magnitude of its effect?
2. What is the influence of particle size on the ability of aerosol to induce toxic effects?
3. Are nanoparticles emitted from motor vehicles an issue? How can we measure them? Are they repeatable or random? To what extent they contribute to the atmospheric nuclei mode?
4. Which are the appropriate laboratory sampling/measurement methods to ensure the necessary conditions for more precise characterization? Which instrumentation should be used? What about method's quality criteria? (representativeness, accuracy, repeatability, reproducibility, etc.)
5. Which is the most appropriate representation of the transportation sector to the ambient PM concentration? Are emission factors the most appropriate tool for identifying emission sources and considering response scenarios? How can we predict the future based on today's air pollution? What kind of investigation is needed to understand better the processes responsible for dispersion of PM in the urban atmosphere? What is the potential for closer work between exhaust investigators and atmospheric modelers?

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