



EFFECTS OF ROAD DUST SUPPRESSANTS ON PM LEVELS IN A MEDITERRANEAN URBAN AREA

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Road dust emissions abatement is currently a major challenge for a sustainable transportation causing exceedances of PM limit values and high population exposure to brake and tire wear metals. Mitigation measures have been proposed such as improved street cleaning and the use of dust suppressants. This study evaluates for the first time the effectiveness of Ca-Mg acetate (CMA) and MgCl₂ in reducing road dust emissions in a Mediterranean city. During a two-month campaign a typical trafficked street in the city of Barcelona was sprayed and changes in PM_x levels and components were monitored at four traffic sites and one background monitoring sites. The integrated results indicate no clear effectiveness of dust suppressants. Episodic reductions of brake wear tracers were observed during CMA applications but they were not systematic over different stations and spreading days, with no reduction of PM₁₀ and PM_{2.5-10}. MgCl₂ coincided with lower PM₁₀ concentrations at the test sites, but its effect was not confirmed by actual drops of mineral and brake-related species. In addition, an unexpected side effect of CMA was found, consisting in NH₃ stripping from the road surface (induced by the formation of Mg(OH)₂) and consequent marked increase of secondary inorganic aerosols as supported by laboratory experiments results.