



PM levels and composition in Mexico City Metropolitan Area during the MILAGRO-2006 Campaign

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Measurement of levels of PM₁₀, PM_{2.5} and PM₁ as well as chemical speciation studies of PM₁₀ and PM_{2.5} were carried out during the MILAGRO campaign (1st to 31st March 2006) at urban, suburban, rural background and industrial sites in the Mexico City Metropolitan Area (MCMA) and adjacent regions. PM₁₀ and PM_{2.5} daily levels varied between 50-56 $\mu\text{g}/\text{m}^3$ and 24-46 $\mu\text{g}/\text{m}^3$ at the urban sites, 22-35 $\mu\text{g}/\text{m}^3$ and 13-25 $\mu\text{g}/\text{m}^3$ at the rural sites, and 75 $\mu\text{g}/\text{m}^3$ and 31 $\mu\text{g}/\text{m}^3$ at the industrial hotspot, respectively; lower than those recorded at some Asian mega-cities. Other important features were that the ratio PM_{2.5}/PM₁₀ and levels of most metals were also much lower than those registered at the Asian megacities. At the urban sites, hourly PM_{2.5} and PM₁ concentrations showed a marked impact of road traffic emissions and dust resuspension. At the suburban and rural sites, the PM daily patterns were highly influenced by the pollution plume from MCMA and also on local soil resuspension.

The speciation studies showed that mineral matter accounted for around 25 % of bulk PM₁₀ at the urban sites and a higher proportion (up to 43 %) at the suburban and rural sites. This pattern is repeated in PM_{2.5}, with 15% at urban and 28% at suburban and rural sites. Carbonaceous compounds accounted for a significant proportion at the

urban and industrial sites (32-46% in PM_{10} , and 51-55% in $PM_{2.5}$), markedly reduced at the suburban and rural sites (16-23% in PM_{10} , and 30% in $PM_{2.5}$). The secondary inorganic aerosols accounted for 10-20 % of bulk PM_{10} at urban, suburban, rural and industrial sites, with a higher proportion (40%) at the industrial background site. A relatively high proportion of nitrate in rural sites was present in the coarse fraction. Typically anthropogenic elements (As, Cr, Zn, Cu, Pb, Sn, Sb, Ba, among others) showed considerably high levels at the urban sites; however levels of particulate Hg and crustal trace elements (Rb, Ti, La, Sc, Ga) were generally higher at the suburban site.

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