Development and Evaluation of a Gas and PM Emissions Inventory for Mexico City

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One of the main goals of MCMA-2006/MILAGRO Campaign (http://www.mce2.org) is to study the emissions of primary pollutants, the atmospheric processes leading to the formation of secondary aerosols from precursor gases, as well as to understand the transport and transformation of these gases and aerosols on local, regional, and global scales. Evaluation of these processes using chemical transport models requires an emissions inventory with detailed information of emitted gaseous and particulate matter (PM) pollutants. We have developed an emissions inventory for the Mexico City Metropolitan Area (MCMA) that includes both speciated gas and partitioned PM emissions. Emissions from point, area (biogenic and anthropogenic) and mobile sources are spatially and temporally resolved by using a bottom-up approach with a Geographic Information System. The emissions of gaseous species are based on the SAPRC99 chemical mechanism. The PM is partitioned in its primary organic, primary elemental carbon, and primary inorganic components (sulfates, nitrates and ammonium). Crustal species and aerosol water content are also considered in the partitioning. The estimated emissions inventory is implemented in the PMCAMx and the CMAQ/Models3 regional chemical transport models. The simulated aerosol composition from these models is compared with measurements from the MCMA-2006/MILAGRO Campaign.