

TITLE: Emissions from forest fires near Mexico City

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Abstract. The emissions of NO_x and HCN (per unit amount of fuel burned) from fires in the pine-savannas that dominate the mountains surrounding Mexico City (MC) are about 2 times higher than normally observed for forest burning. The NH₃ emissions are about average for forest burning. The NO_x/VOC mass ratio for the MC-area mountain fires was ~0.38, which is similar to the NO_x/VOC ratio in the MC urban area emissions inventory of 0.43, but much larger than the NO_x/VOC ratio for tropical forest fires in Brazil (~0.068). The nitrogen enrichment in the fire emissions is probably due mostly to deposition of nitrogen-containing pollutants in the outflow from the Mexico City urban area. This effect may occur worldwide wherever biomass burning coexists with large urban areas (e.g. the tropics, southeastern US, Los Angeles Basin). The molar ratio HCN/CO for the mountain fire emissions was $\sim 0.0128 \pm 0.0096$ - 2-9 times higher than widely used literature values for biomass burning. The MC-area/downwind molar ratio of HCN/CO is about 0.003 ± 0.0003 . Thus, if other types of biomass burning are relatively insignificant, the mountain fires may be contributing about 23 % of the CO production in the MC-area (~ 98-100 W and 19-20 N). Comparing the PM₁₀/CO mass ratio in the Mexico City Metropolitan Area emission inventory (0.011) to the PM₁/CO mass ratio for the mountain fires (0.133) then suggests that these fires could produce as much as ~ 78 % of the fine particle mass generated in the MC-area.