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## Atmospheric Dry Deposition in the Proximity of Oil-Fired Power Plants at Mexican Pacific Coast

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### ABSTRACT

Dry deposition samples were collected in a weekly basis during 2010 in a site located at the Mexican Pacific Coast: Manzanillo, Colima. Samples were collected with an automatic wet/dry deposition sampler using nylon filters as surrogate surfaces. Samples were extracted with deionized water and analyzed for pH, conductivity, Na<sup>+</sup>, K<sup>+</sup>, Ca<sup>2+</sup>, Mg<sup>2+</sup>, NH<sub>4</sub><sup>+</sup>, NO<sub>3</sub><sup>-</sup>, SO<sub>4</sub><sup>2-</sup> and Cl<sup>-</sup>. Nitrate and sulfate were the most abundant ions, contributing with 53% to the total ionic mass; and their levels exceeded the hemispheric background concentrations proposed for marine remote sites. The influence of the power plants burning combustoleo located upwind the sampling site was completely evident. From meteorological analysis, it could be observed that the sampling site was all time under the influence of power plants as a result of the effect of breezes. However, in spite of the high levels of NO<sub>3</sub><sup>-</sup> and SO<sub>4</sub><sup>2-</sup> found in the samples collected, pH value average was almost neutral, with 28% of samples slightly acid. Potassium was the most abundant cation and from the quantification of the neutralization effect of the main alkaline components, the prevalence role of K<sup>+</sup> was completely evident, suggesting the influence of the mining complex Peña Colorada located upwind the sampling site, where amyl xanthate potassium is used as collector in tailing dams. Dry deposition fluxes were estimated for all ions measured. Nitrogen dry deposition at Manzanillo is already in the upper extreme of the threshold value reported for sensible ecosystems. On the other hand, sulfur deposition exceeded slightly the critical load value reported for some ecosystems in Europe. Even at this moment, nitrogen and sulfur deposition is not a problem, it is necessary to take steps to avoid that total deposition of these elements exceeds critical loads, considering that results reported in this study not include the wet deposition fluxes.

### KEYWORDS

Dry Deposition; Dry Fluxes; Oil-Fired Power Plants; Combustoleo; Mexico

### Cite this paper

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