

Identification of volatile organic compounds by gas chromatography-mass spectrometry in aerosols collected at T1 (Tecamac, Edo. México)

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The chemical characterization of atmospheric aerosols was among the main scientific objectives of the MILAGRO campaign performed during March, 2006. It was important not only to apply fully-tested techniques for the identification of the organic component of the collected atmospheric aerosols, but also to find new methodologies or optimized ways to do the identification of the organic compounds in the material collected. In this project, we were interested in analyzing qualitatively and quantitatively the volatile organic compounds (VOC's) bounded to aerosols collected at the supersite T1, which was located in Tecamac, Edo. de México.

A diurnal and nocturnal twelve-hour sampling on aluminum filters was performed with a ten-stage MOUDI. The filters were cut in two parts, one was used for a gravimetric analysis and the other half was used for the gas chromatographic-mass spectrometric analysis. Before the chromatographic separation, the filter was heated to 200°C during 60 minutes in a pre-evacuated glass chamber. The VOC's was then immediately introduced to the gas chromatographer via a pneumatic automatic six-port valve. The chromatographic separation was done following the TO-15 EPA method. The spectrometric identification is performed by digital and visual comparison of the individual spectra with the NIST library (v. 2002). Following this methodology we have identified two saturated hydrocarbons, one aromatic hydrocarbon, four aldehydes, and three ketones. We have also estimated the mixing ratio of the identified compounds using calibration graphics of selected hydrocarbon compounds. Details of the analytical separations and full results will be presented at the meeting.