



Volatile organic compounds mixing ratios in Santiago del Chile and along the Andes mountains.

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Air quality has become an issue of major concern in countries world-wide. Few studies have been conducted in Latin America on levels of volatile organic compounds (VOCs). VOCs form an important group of air pollutants. The interest in their study relays in their contribution to air quality problems, through their implication in the formation of tropospheric ozone and secondary organic aerosols. In addition, several VOCs found in urban air are carcinogens (e.g.:1,3-butadiene, benzene).

The project *Bicycl'Air*, conducted from December 2005 to March 2006, aimed to improve knowledge of air quality along the Andes mountains, and especially in Santiago del Chile, focussing on VOCs measurements. 120 air samples were taken in Chile and Argentina at different latitudes (from 22°S to 55°S), altitudes (from sea level to 4500m) and sites (urban, rural and remote sites). The samples were collected twice a day by using Tenax® on cartridges and analysed later on by GC-MS (gas chromatography-mass spectrometry).

Because of its geographic location and the weather patterns, Santiago suffers from high atmospheric pollution levels. The results show a range from 2.9 to 9.5 ppbv for benzene and from 1.9 to 54.7 ppbv for toluene. Observed diurnal variation shows most elevated values of the VOCs in the morning and in the late afternoon. Vehicle-induced emissions combined to local meteorology remained the main source of pollution in the city. As a contrast, Atacama desert, 1500km north of Santiago, presents the lowest mixing ratio (0.68 ± 0.36 ppbv for benzene and 0.35 ± 0.29 ppbv for toluene). Sam-

ples taken on different locations all along the roads in the Andes mountains show high variability of aromatic compounds (from 0.1 to 3 ppbv for benzene and toluene), depending on the traffic density and the origin of the air mass. Benzene to toluene ratio was used to estimate the air mass age. A surprising high value, up to 27, was observed on the most remote road in Chile (*Carretera Austral*) and will be discussed.