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BTEX emissions to the atmosphere from road traffic in Tenerife, Canary Island, Spain

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The Earth's atmospheric environment is changing at unprecedented rate. Emissions of carbon dioxide, methane, nitrous oxide, and gases as the organic volatile compounds (VOCs) are causing perturbations in the chemical composition of the atmosphere, giving rise to increasing temperatures and other changes to climate (N. Hewitt., 1999). VOCs emissions not only comprise a broad spectrum of volatile species, but also are produced by a wide variety of sources. The main sources of VOCs emission to the atmosphere are road transport, combustion of solid fuels in small furnaces, use of organic solvents, disposal of organic waste on landfills, and rumiant husbandry (Obermeier et al., 1995). Road traffic is one the most significant sources of primary air pollutants in the industrialized world. Hydrocarbons emitted directly by vehicles have an influence on human health due to their toxicity (e.g. benzene and other polycyclic aromatic compounds), but these compounds and also precursors of the secondary atmospheric pollutants formed by photochemical processes, such as ozone. Recent research activities on VOCs emission from road traffic at Tenerife were carried out inside a 1 Km long tunnel located at the exit of the Tenerife's biggest twon, Santa Cruz de Tenerife. An order of ten thousands vehicles at an average speed of 60 km/h pass daily through this tunnel just to exit from this town. The aim of this study is to evaluate VOCs emission rates to the atmosphere due to road traffic at Tenerife by means of this "lab" tunnel. Air samples inside tunnel were taken by grab-sampling in 400 cm^3 stainless-steel canister. VOCs analysis was carried out by means of GC/MS/MS. Preliminary results showed that the highest fraction of VOCs emission rate by road traffic through the tunnel were related to BTEX components. The tunnel's BTEX emission rates were in the order of several grams per kilometre in a hourly basis (Nolasco et al.,

2003). Transportation Department data allows us to estimate BTEX emission rate due to the road traffic that enters and leaves Santa Cruz de Tenerife (235,000 vehicles) and circulate though the major road system at Tenerife Island (911,110 vehicles). Therefore, BTEX emission rate due to the road traffic that enters and leaves Santa Cruz de Tenerife in daily basis were estimated about 8.3 kg per kilometre. If the average distance travelled by vehicles at Tenerife is about 10 km, BTEX emission rate were estimated about 350 kgd^{-1}. These results suggested that road traffic at Tenerife is an important anthropogenic source of VOCs emission to the atmosphere.

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