



Determination of VOCs emissions in vehicular exhausts and their impact on air quality in Reykjavik, Iceland

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Volatile organic compounds (VOCs) are potentially cancerogenic and are therefore health threatening atmospheric pollutants. Furthermore, VOCs are highly reactive and lead to ozone and organic aerosol formation and accordingly impact also on the Earth's climate. The dominant source of anthropogenic emission of VOCs in urban areas is frequently originating from fossil fuel powered vehicles. Air quality in the capital area of Reykjavik in Iceland displays one of the cleanest air quality observations in the world, even though car density per capita in Reykjavik is one of the highest worldwide. In order to determine the effects of vehicle emissions on air quality, we measured VOC concentrations in vehicular exhausts from differently powered cars and trucks (methane, gasoline and diesel) as well as passive air samples from selected locations in Reykjavik. All samples were analysed using gas chromatography with the thermal desorption. The preliminary results indicate that air quality in Reykjavik is reduced due to high VOCs concentration during temperature inversion on cold winter days. Significantly higher VOC emissions from gasoline and diesel exhausts reveal the high contribution to the air pollution of fossil fuel based transportation. These results disclose that air quality in the sub-arctic capital of Iceland can indeed decline due to fossil fuel powered vehicles and that an increase of alternative transportation options could improve air quality. Based on these results we conclude that a shift toward electric and methane powered transportation is advisable.