**Ion Chromatography with sampled Particulate Matter**

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The research group of Prof. Marouane Temimi is carrying on an Air Quality project for the Ministry of Climate Change and Environment (MoCCE).

As part of this project, we analyze air quality data from major pollutants such as Ozone, Sulphur Dioxide, Nitrogen Dioxide, Carbon Dioxide and Particulate Matter (PM) (total suspended particles in air with diameter varying from ~ 1m to 10m)

Both gaseous and particle pollutants concentrations are measured in real time. However, the composition of particle matter is only known when the particles are analyzed with analytical chemistry procedures.

Particulate Matter (PM) is mostly composed of ions Nitrate (NO3-), Sulphate (SO4-), Ammonium (NH4+), metallic elements, Carbon, Dust (mostly sand) and Sea Salt. These components represent the PM speciation of each particulate matter samples that are usually collected on Quartz or Teflon filters (typical size of filters is 47mm). Sampling of PM is carried out with samplers pumping ambient air through an inlet connected to a filter holder.

The estimation of the concentration of PM chemical species is used to estimate the sources of pollution in the location where the PM sample has been collected. However, this is only possible if several PM samples are collected at the same conditions and time intervals at a given location. The so-called “*source apportionment*” statistical method, uses time series of PM total mass concentrations and their chemical species as the main input data to estimate pollution sources.

Ion chromatography (IC), together with Total Carbon analysis (TOC) and Energy- dispersive X-ray spectroscopy (EDX) allow the quantification of the main chemical species in PM samples and therefore the source of pollution in a given geographical area.

This is the first time that samples of Particulate Matter are going to be analyzed at Masdar through Ion Chromatography. The purpose of a first trial analysis with IC is to explore and setup the best methodology for sample preparation and protocol to estimate the amount of ions (NO3-, SO4-, NH4+, Na+, Cl-, K+, PO4+, etc.) in PM samples collected at three locations in Masdar City.

We want to thanks Dr. Grzegorz Brudecki for his valuable expertise in IC and his availability to help us setting up the above methodology.