

# CHEMKAR PM<sub>10</sub>

## A year-long chemical characterization of PM<sub>10</sub> in Flanders (Belgium) in 4 major cities and 3 types of locations

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Keywords: PM<sub>10</sub>, chemical characterization, elemental carbon, streetcanyon

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From July 2011 until July 2012 the Flemish Environment Agency (VMM) carried out its fourth “Chemkar PM<sub>10</sub>” campaign as part of the European Life+ ATMOSYS project. This was a large scale chemical characterization project of PM<sub>10</sub> in Flanders (Belgium) in four major cities (Antwerp, Ghent, Bruges and Ostend; see also *Figure 1*). In each city measurements were done at 3 types of locations: a streetcanyon, an urban background and a regional road. The focus of the current project was to compare the results on both a city and location type level. Such comparison allows us to assess the contribution to PM<sub>10</sub> that can be attributed to local contributions like a streetcanyon. Besides the total PM<sub>10</sub> mass, ions, metals also elemental- and organic carbon (EC/OC) and levoglucosan (wood burning tracer) were analysed.

### Experimental setup:

During one full year PM<sub>10</sub> was sampled simultaneously on every 4<sup>th</sup> day at each location type in each city totaling **about 1000 samples** (including field blanks).

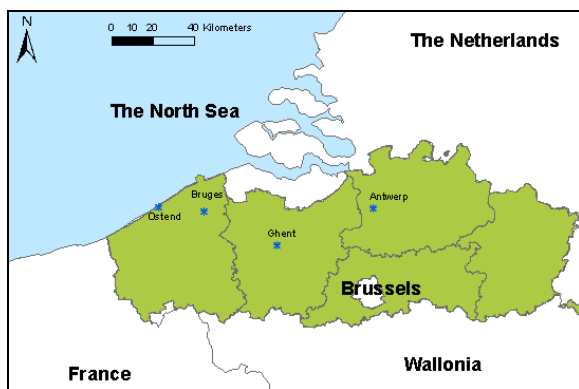


Figure 1: Location of the project cities

Sampling was done for 24h with one Leckel SEQ 47/50 low volume sampler at 2.3 m<sup>3</sup>/h on 47mm Pallflex® Tissuquartz™ 2500 QAT-UP filters. After sampling the PM<sub>10</sub> mass concentration was determined by dual weighing of the filters according to the European reference method EN14907. Next,

the filters were punched for chemical analysis and stored at -18°C until analysis. One punch (1.5 cm<sup>2</sup>) was used for the determination of **elemental and organic carbon** (thermal/optical transmittance) with the NIOSH protocol. Another punch (1.5 cm<sup>2</sup>) was used for determination of **levoglucosan** by means of GC/MS after derivatisation with *N,O*-bis(trimethylsilyl)trifluoroacetamide (BSTFA) containing 1% trimethylchlorosilane (TMCS).

### Results:

On average, concentrations in the **street canyons** were 7.5 µg/m<sup>3</sup> higher than at the urban background sites. This local contribution was mainly due to the resuspension of mineral dust (+ 3 µg/m<sup>3</sup>), organic matter (+2 µg/m<sup>3</sup>) and elemental carbon (+ 1 µg/m<sup>3</sup>). *Figure 2* shows more detailed results for the streetcanyons in each city.

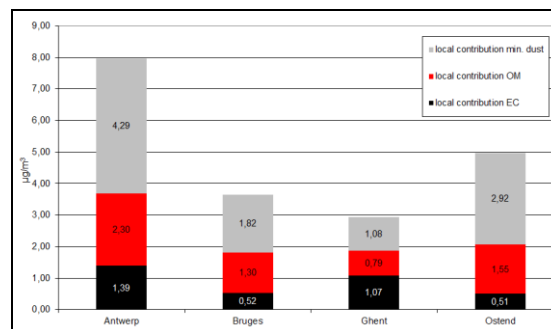


Figure 2: Local contributions to PM<sub>10</sub> in streetcanyons in different cities.

More results and extended analysis will be presented at the conference.