



# Particulate atmospheric pollution around a alumina factory, Gardanne, SE France

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# The problem of atmospheric dusts in south France

From many years, in south France, the EEC limit values for PM10 (and also for PM2.5 and Nox) are not respected, for many reasons :

- several large cities
- very important road traffic (with many trucks)
- important industrial zones
- specific meteorological conditions



**PM atmospheric emissions in PACA area**

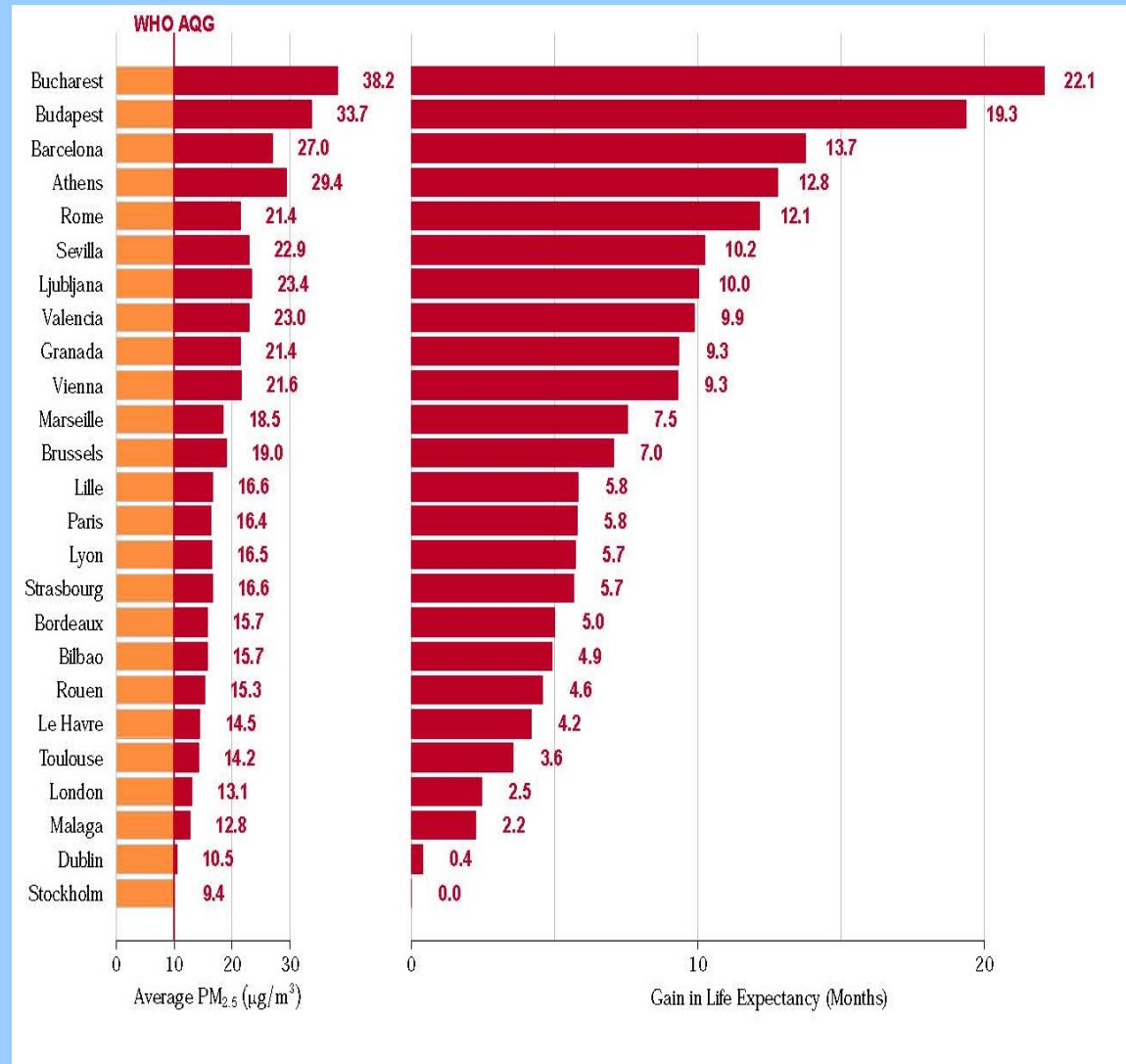
# Dusts and health

All dusts can be dangerous.

This « dangerousity » can

be related to :

- size
- morphology
- specific surface
- chemical composition
- speciation of toxic elements





# The PACTES-BMP project

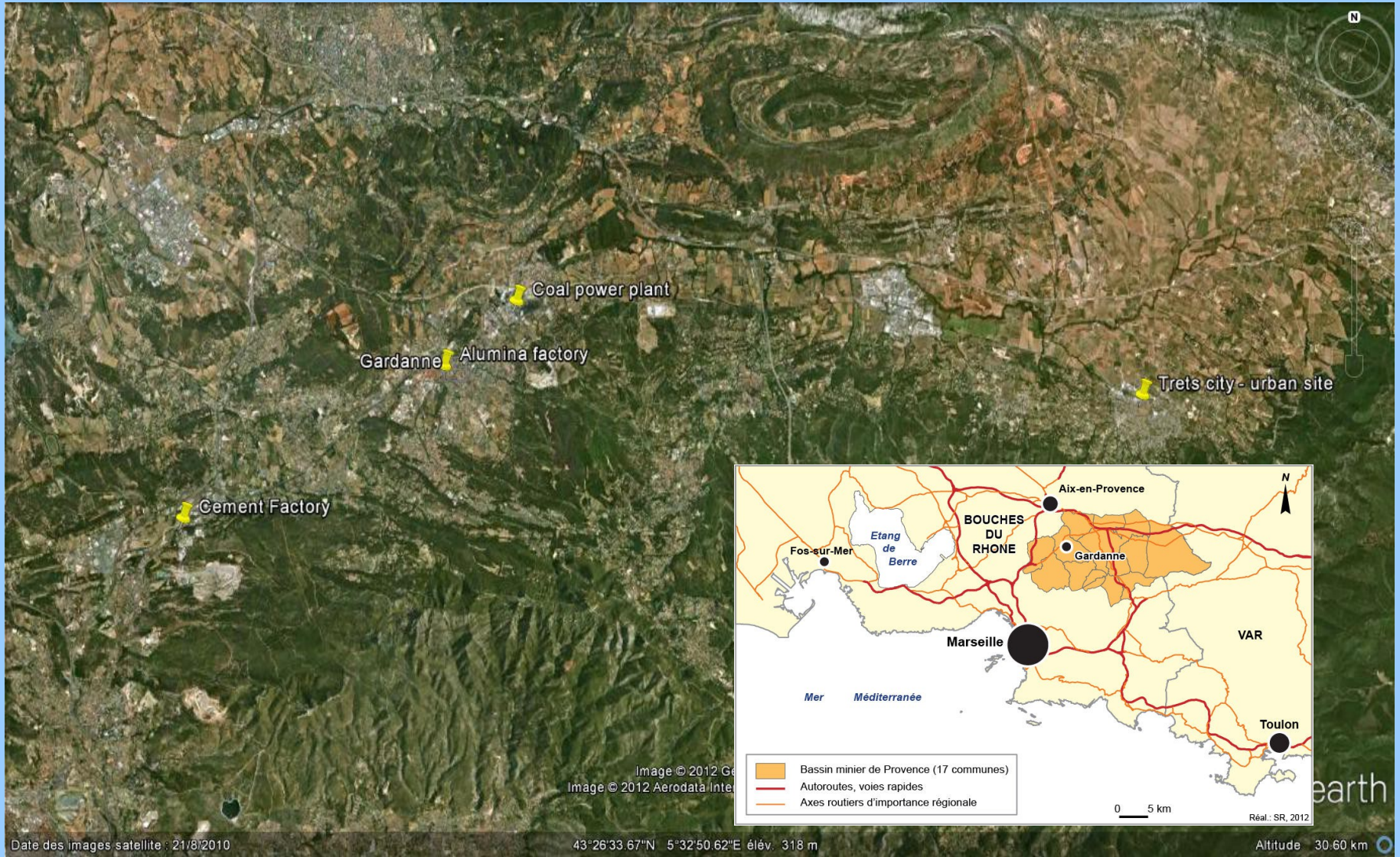
An effective reduction of dusts emissions needs to have a good knowledge of these emissions, especially of the physico-chemical and toxicological characteristics of the dusts. It needs also to know how these pollutions are considered by the people concerned.

In the PACTES-BMP project supported by ADEME, the french environment agency and by the OHM-BMP (CNRS-INEE), we have choose to study particulate atmospheric emissions from different minerals industries near Gardanne (SE France).

Our project is divided in three axes :

- **physico-chemical characterization of the emitted dusts in the proximity of the industries ;**
- characterization of the genotoxicity of the PM<sub>2.5</sub> fraction ;
- estimation of the pollution perception by the suroounding populations and comparison of these perceptions with the experimental results.

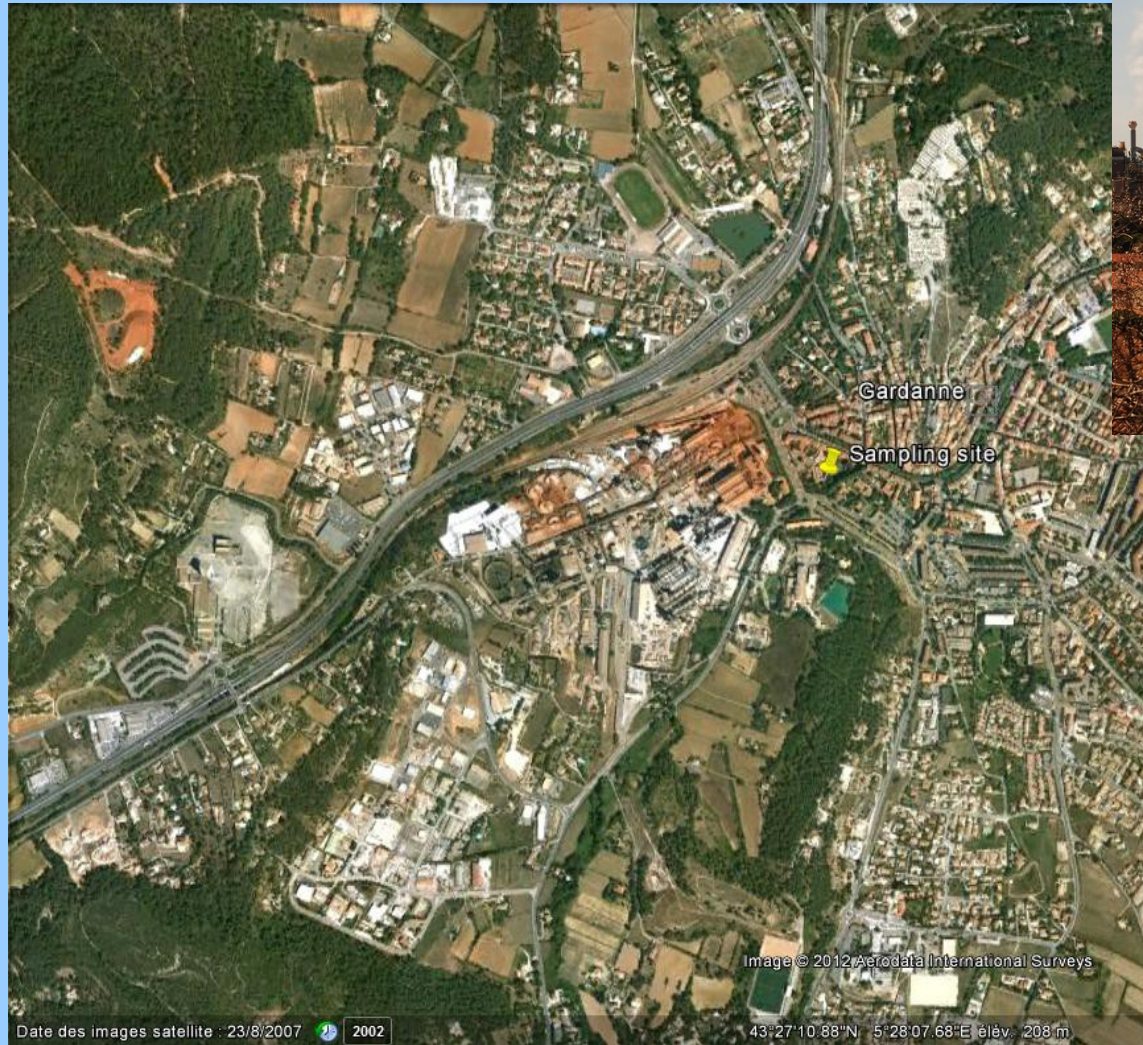
# The studied area



# The cement factory



# The alumina factory



# The coal power plant



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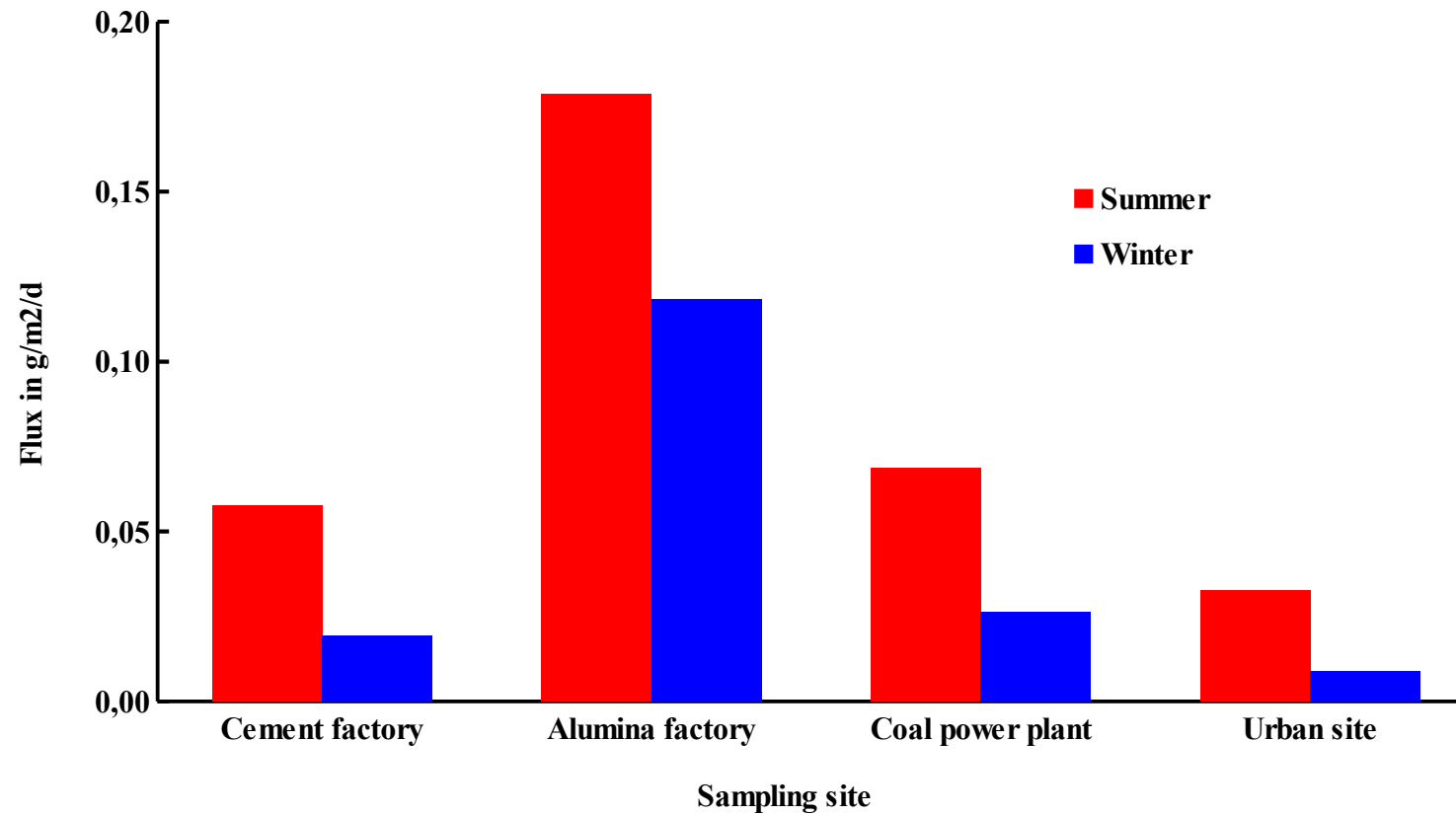
# The urban site



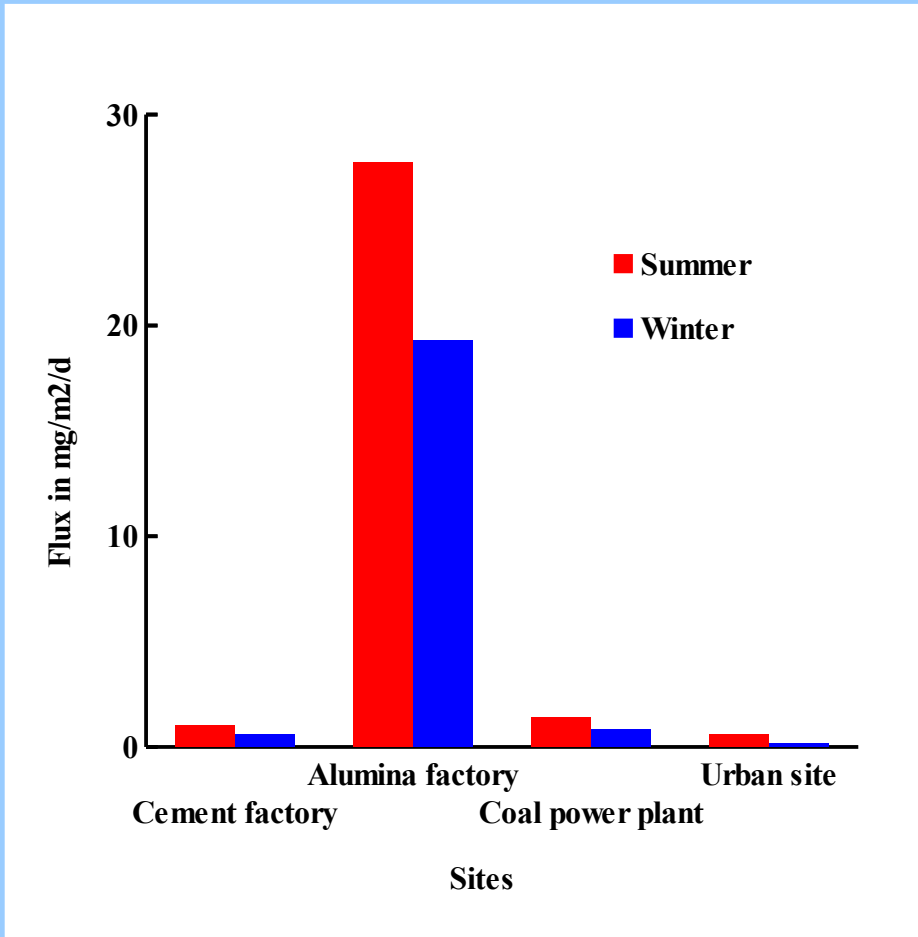
# The sampling campaigns

- from June 30th to August 2nd, 2010
  - from January 3rd to February 2<sup>nd</sup>, 2011
  - 3 dusts size :
    - Dust deposit
    - PM10
    - PM2.5
- 
- The studies :
    - mass concentration
    - chemical composition
    - morphology and composition of single particles

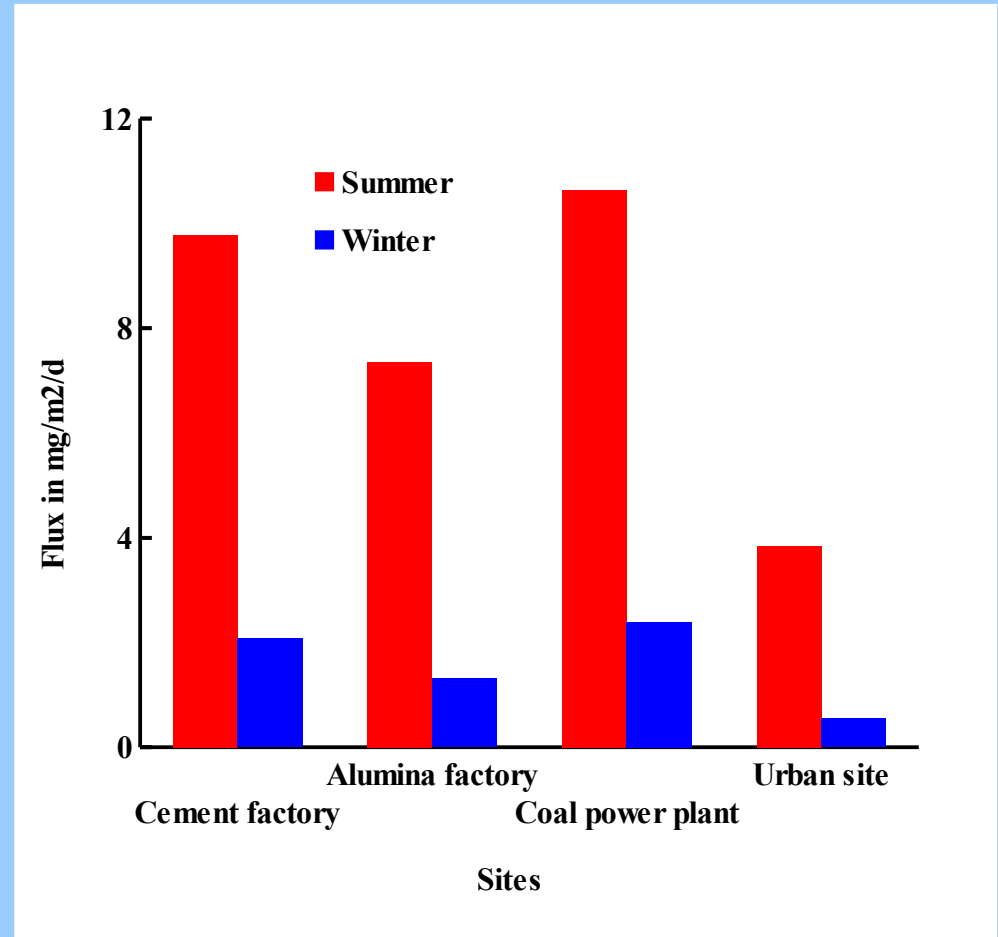
# Dust deposit : Flux



# Dust deposit : chemical composition

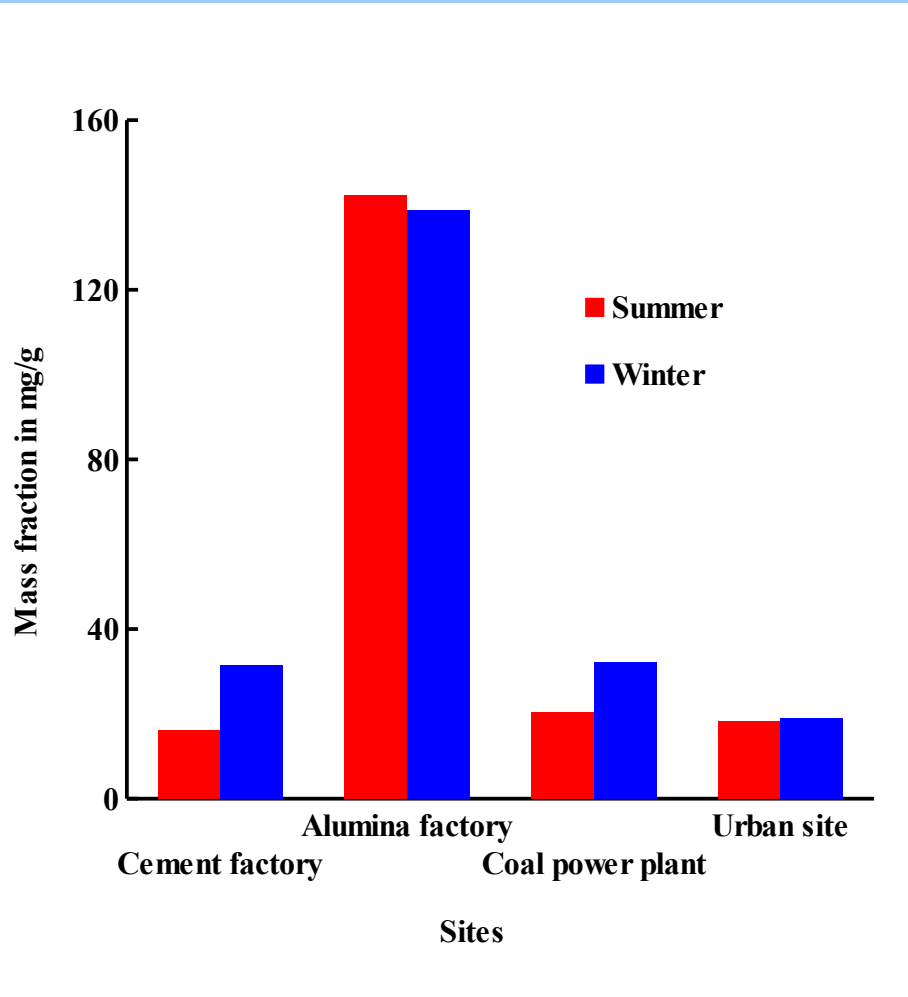


**Aluminium**

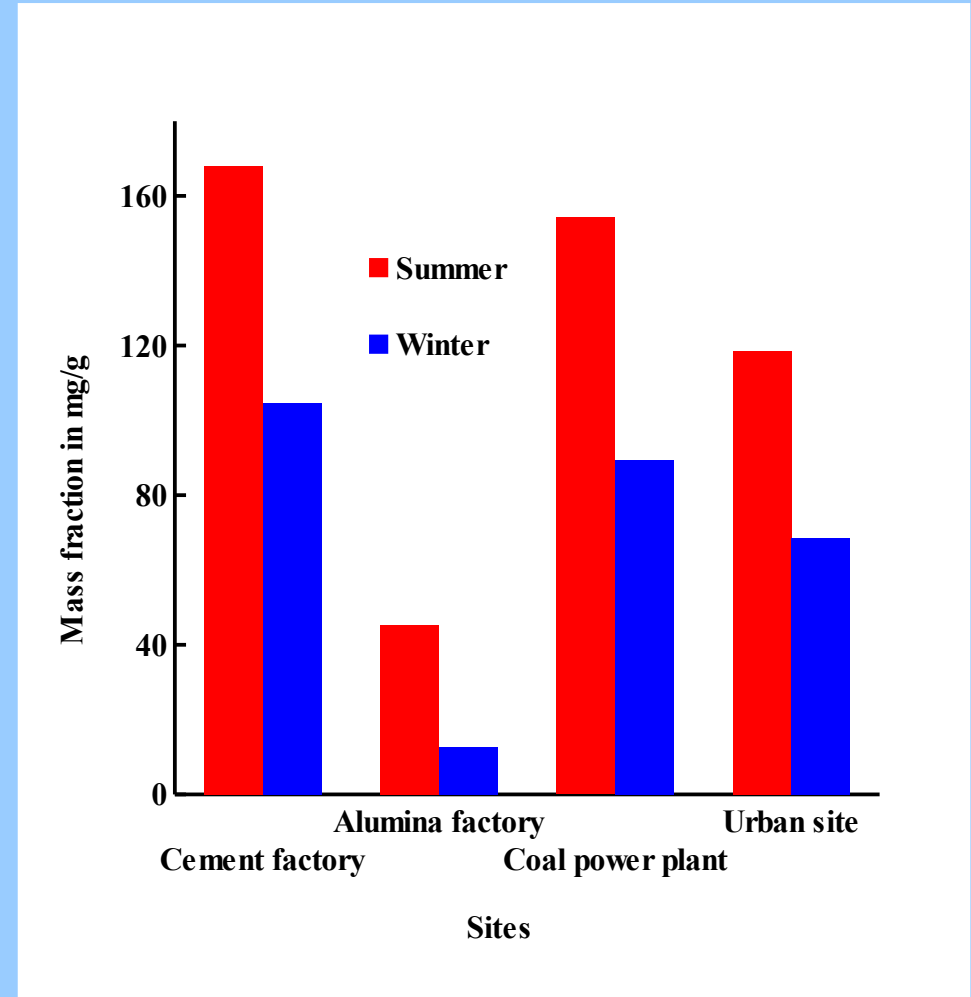


**Calcium**

# Dust deposit : mass fraction

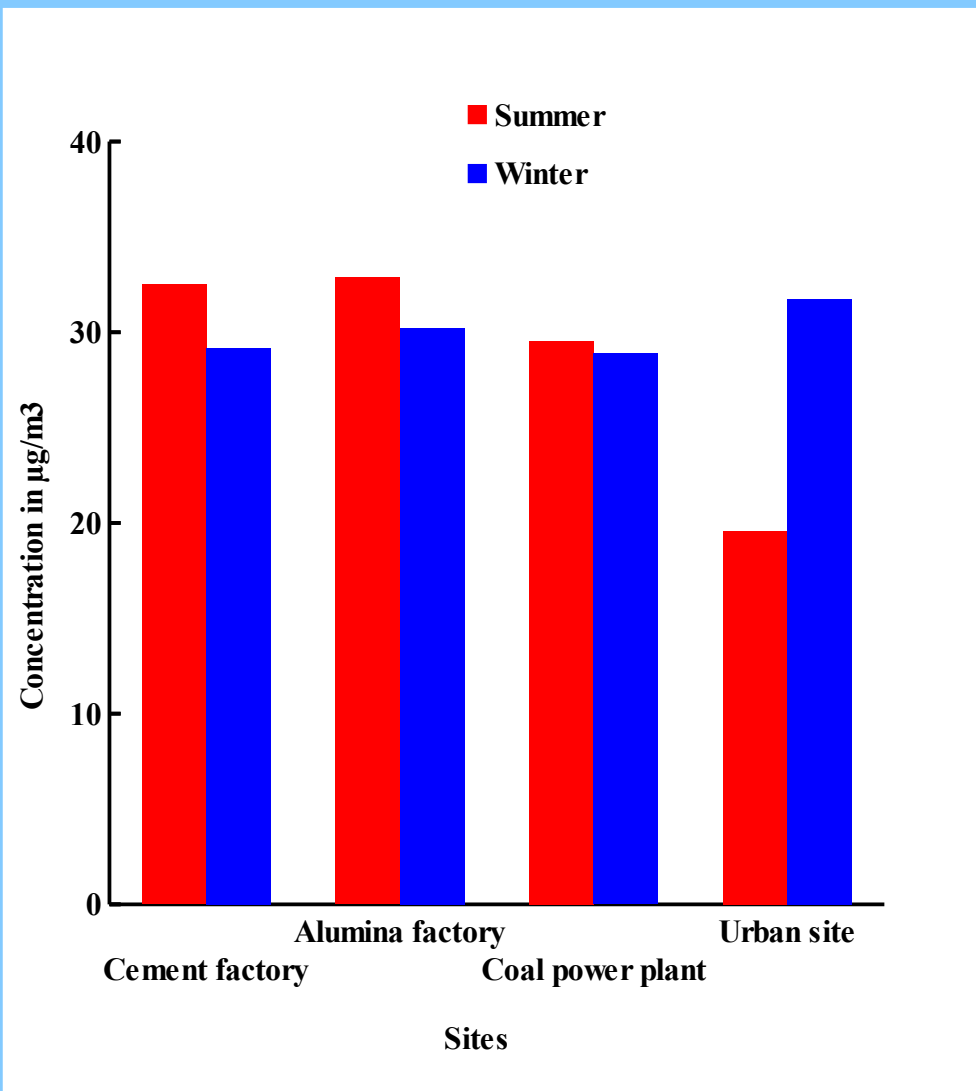


**Aluminium**

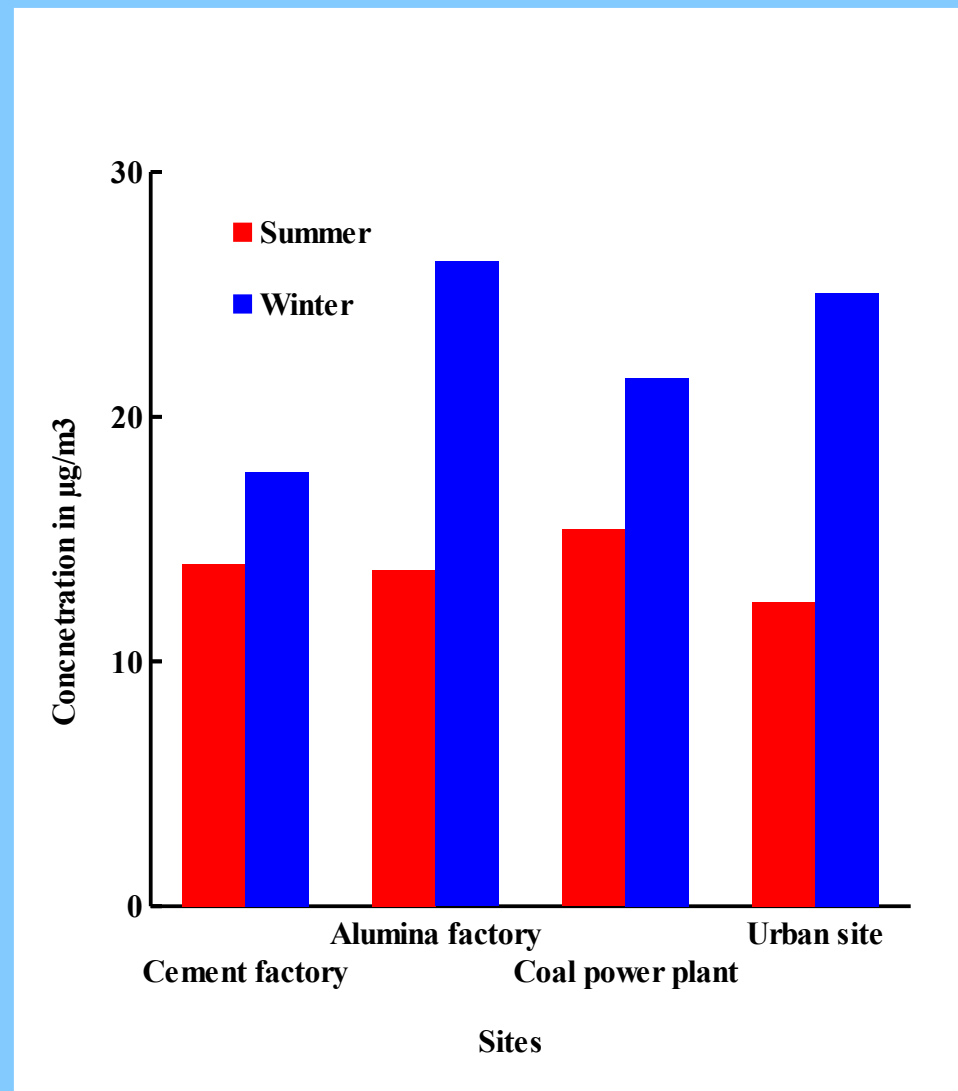


**Calcium**

# PM10 and PM2.5 : concentration

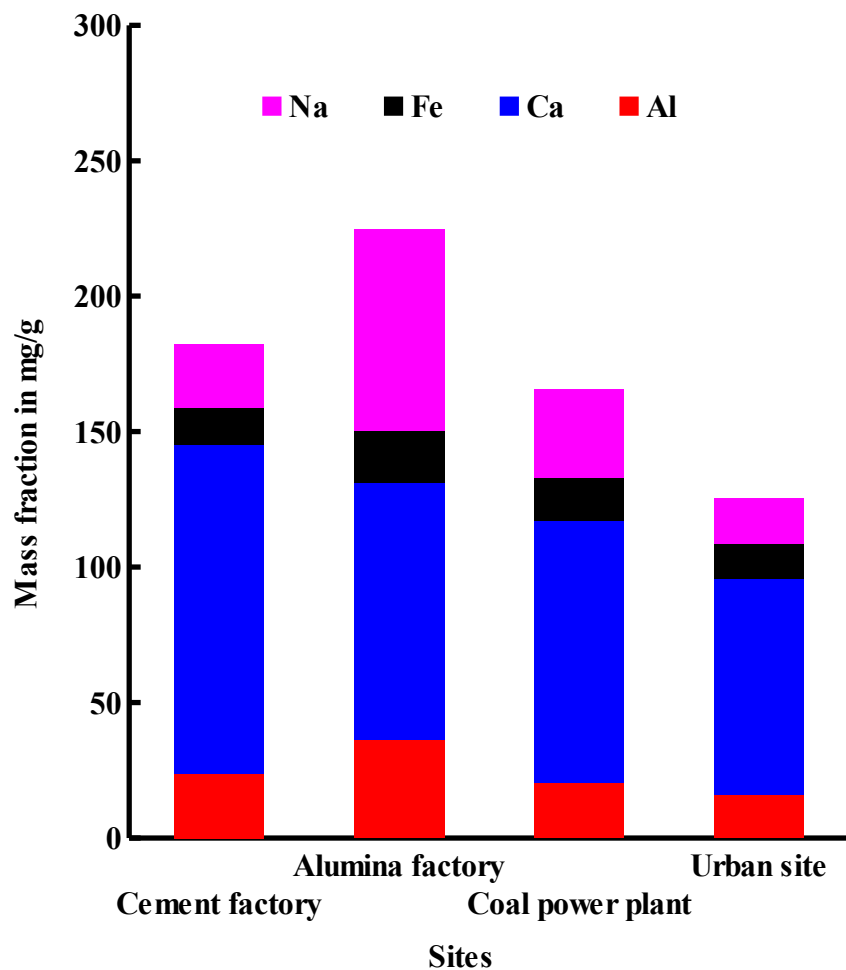


PM10

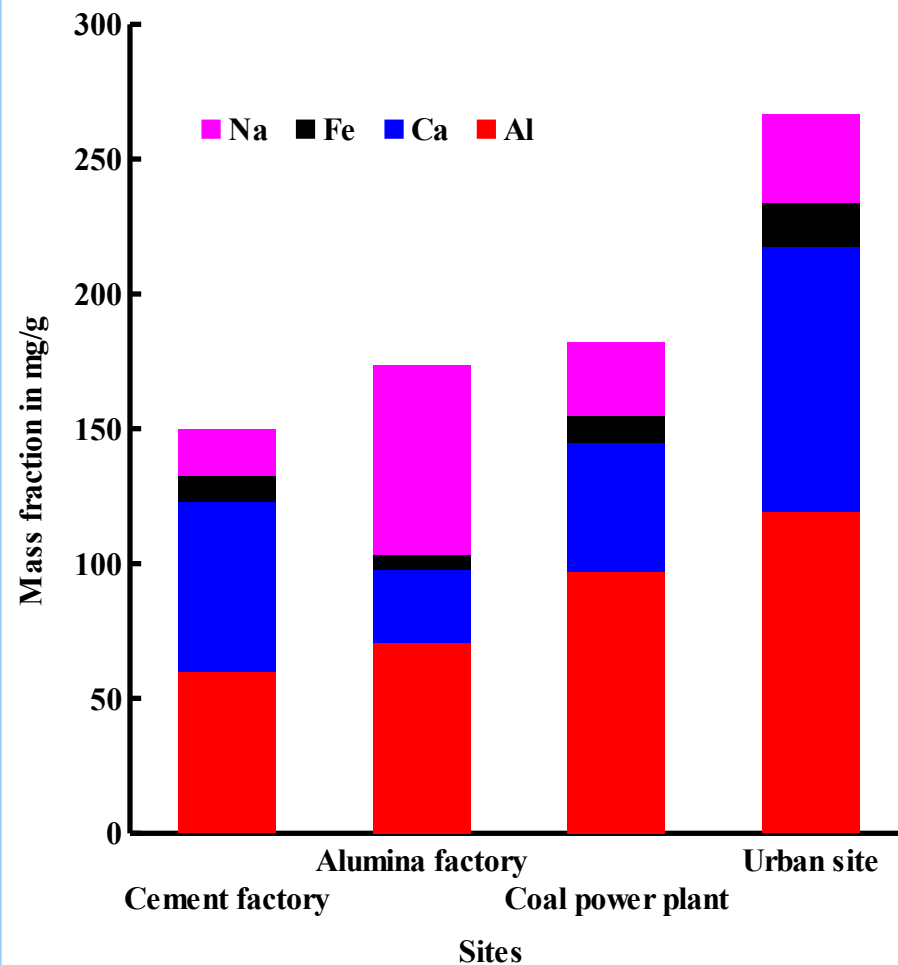


PM2.5

# PM10 an PM2.5 : chemical composition

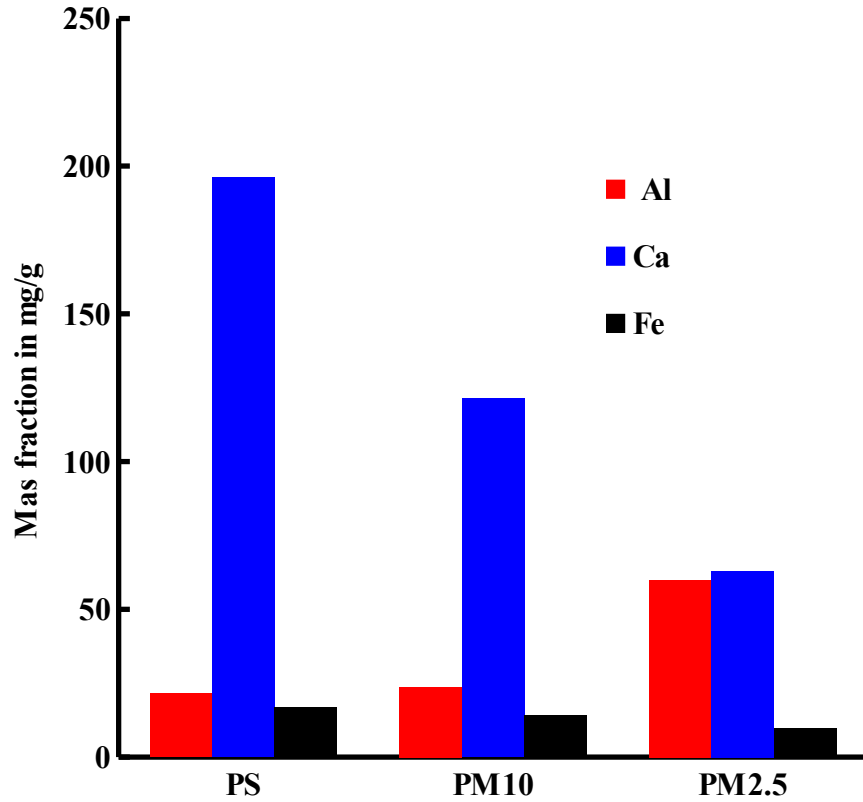


PM10

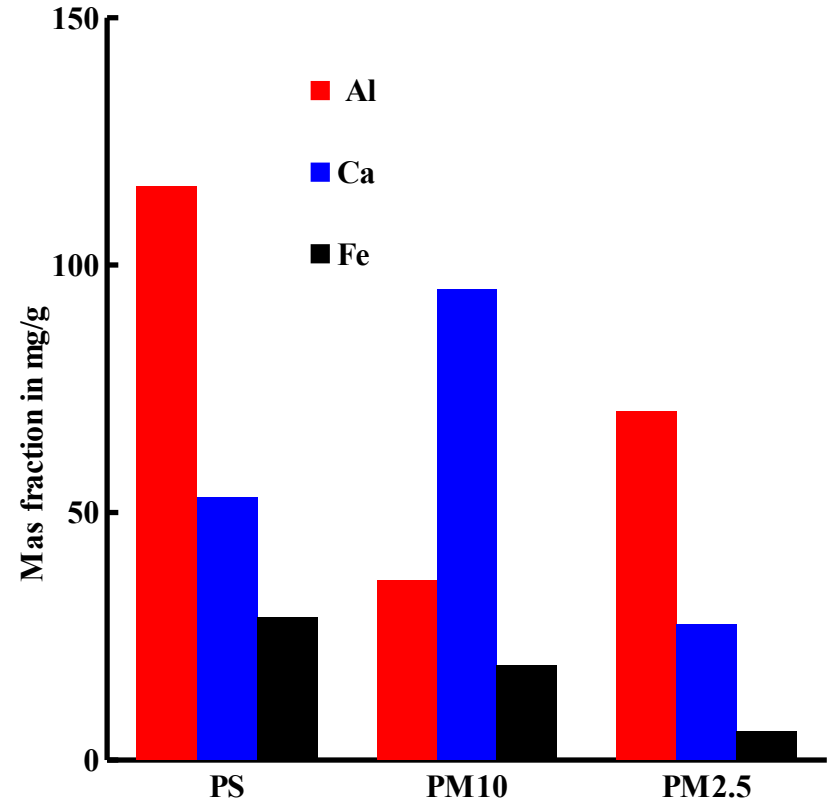


PM2.5

# Composition and granulometry



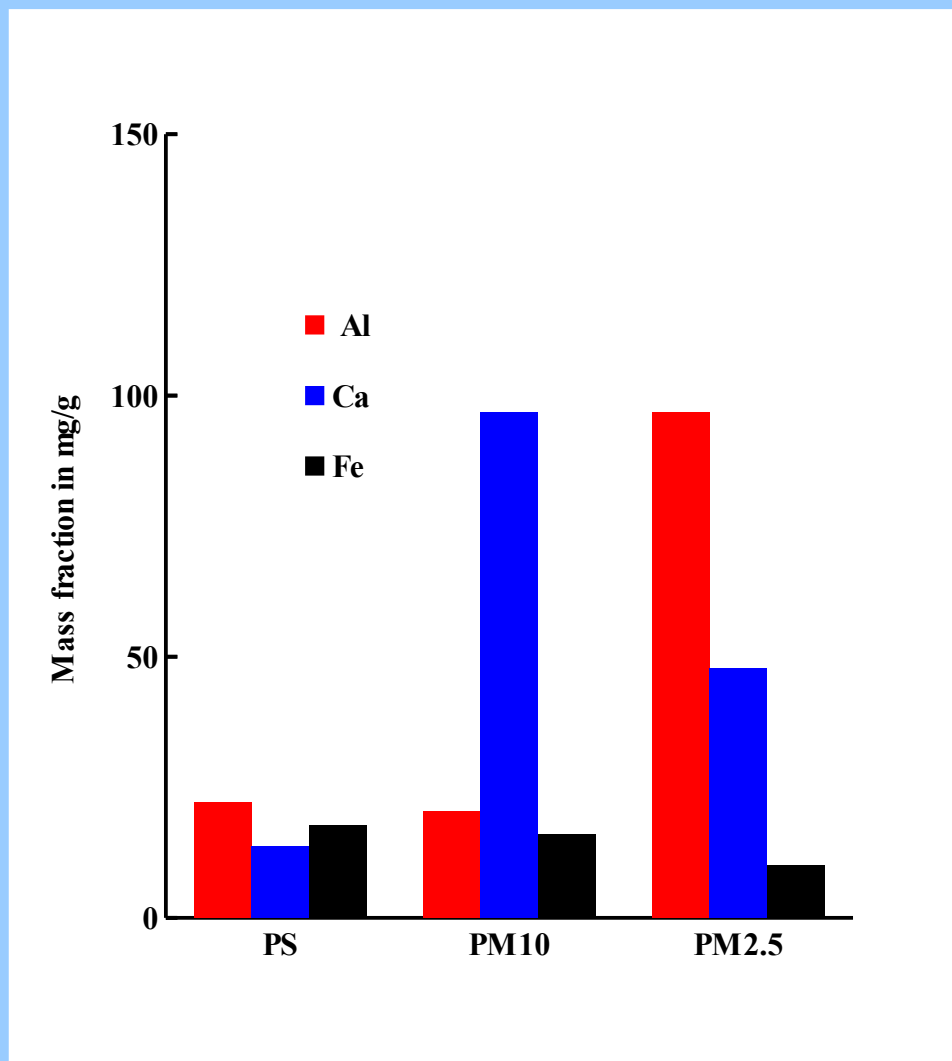
Cement factory



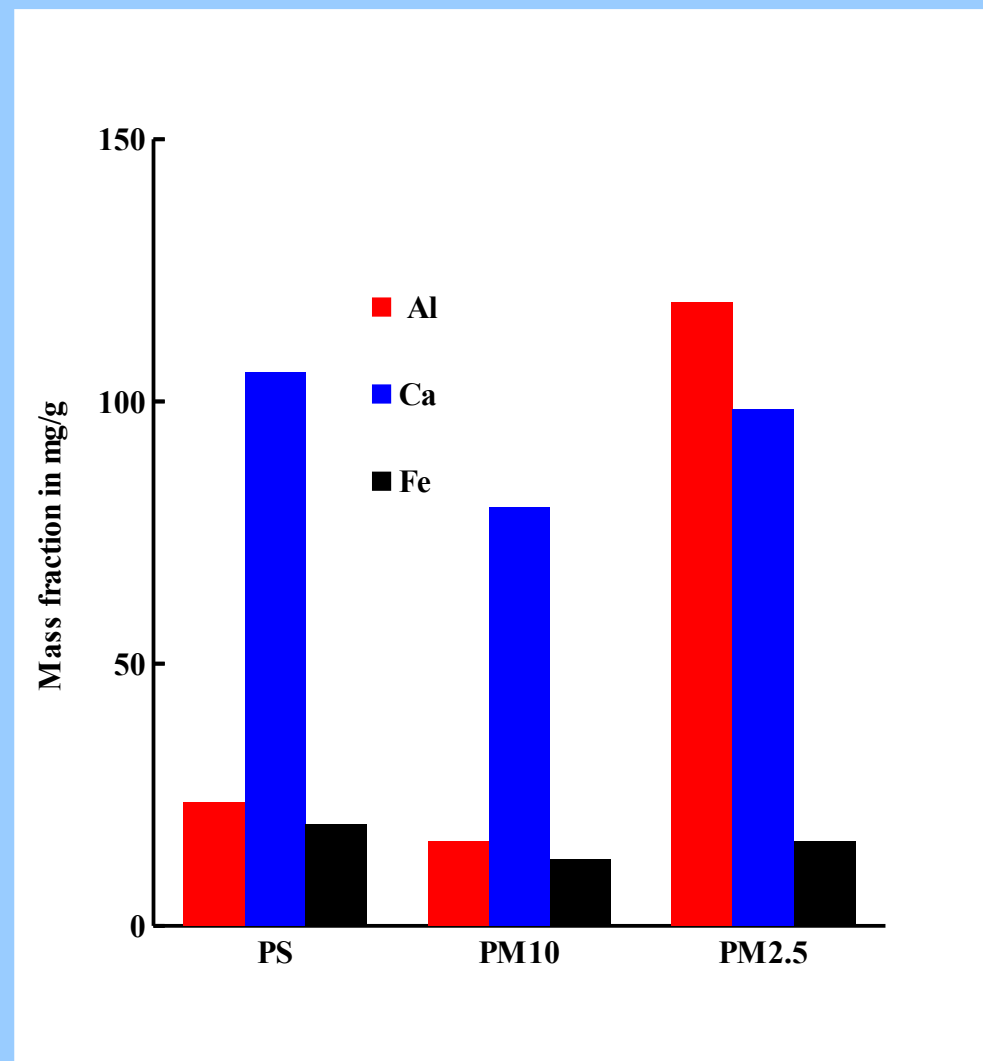
Alumina factory



# Composition and granulometry

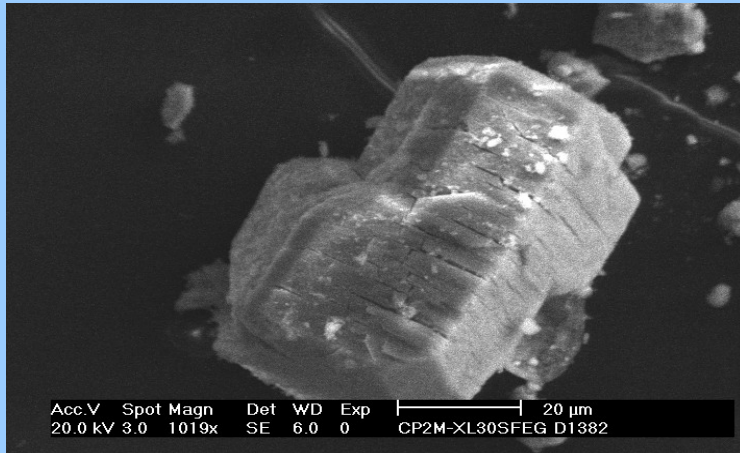


Coal power plant

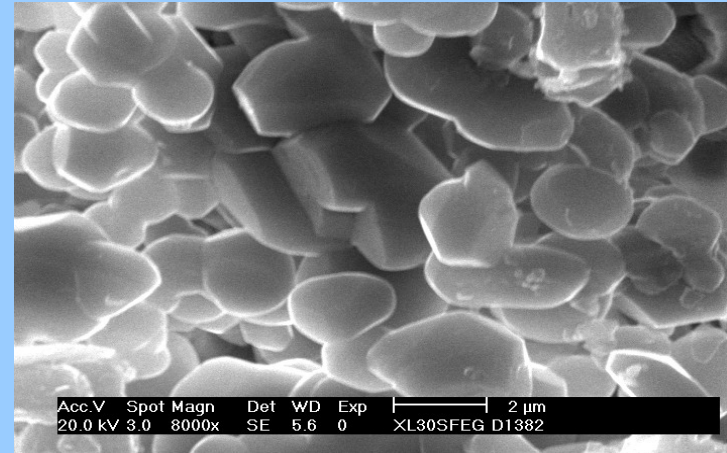


Urban site

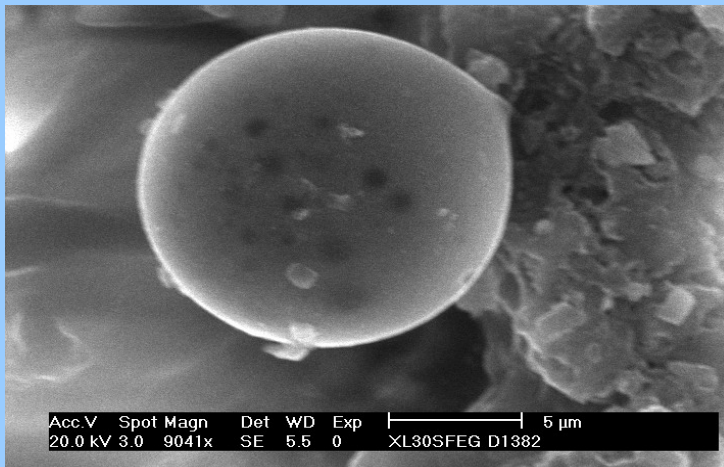
# Conclusion



**Aluminium hydroxide**



**Aluminium oxide**



**Fly ashes**