



European Network on New Sensing Technologies for Air Pollution Control and Environmental Sustainability - *EuNetAir*

COST Action TD1105

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Odour monitoring by olfactometric methods



Magda Brattoli

WG member

Chemistry Department – University of Bari

Italy

Odour pollution

Odour is a pollutant that can have a significant negative impact on both life quality and economic activity. The unpredictability of the annoyance and its persistence over the time cause a negative synergistic effect on psycho-physical behaviour.

The sources...



Waste treatment plants

Livestock and agricultural plants



Wastewater treatment plants



Other industrial activities:

- **Oil refineries;**
- **Paper and metal industries;**
- **Food industries, rendering;**
- **Pharmaceutical and chemical industries;**
- **tanneries;**
- **Olive residues treatment**
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Research issues...

Monitoring methodologies

Impact evaluation

Regulation and policies

Is it possible to apply the same approach used for air quality to odour emissions?



Not strictly...why?

Odour is a complex mixture of compounds, present at different concentrations that react with each other

It's difficult to individuate an analytical method that could simultaneously determine most of the compounds.

The analytical measures have to be related with the intensity of odour perceived by humans

Introduction of innovative analytical approaches:

- Dynamic olfactometry (standardized by EN 13725/2003)
- Multiparametric sensors (continuous measures)

Dynamic olfactometry (EN 13725/2003)

Sensorial methodology

- Instrumental apparatus: diluter in which gas sample is diluted with neutral air according to fixed ratios
- Sensors: selected panel (n-buthanol)
- Odour concentration (ou/m^3)



Advantage:

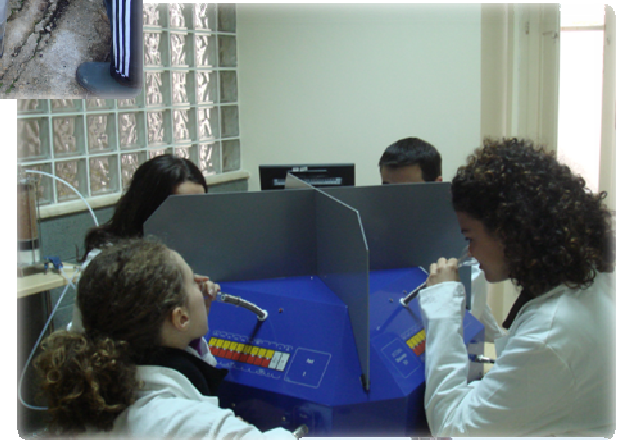
To make objective a subjective sensation



Limitations:

- Not able to perform continuous monitoring
- Rapid time of analysis (maximum 30 h)
- Frequency and duration of analysis are limited
- Too time consuming and quite expensive

The purpose: to validate alternative methodologies correlated with odours



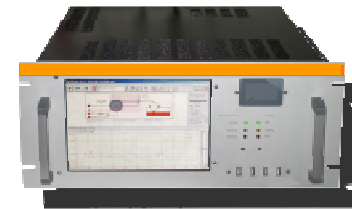
New methodologies in use in our laboratory...

An hybrid instrumentation: Gas chromatography - Olfactometry (GC-O)



It couples the traditional gas chromatographical analysis with a sensory detection, in order to study complex mixtures of odorous compounds

Multiparametric sensors and electronic noses



- ✚ Specifically studied and developed for the different sources
- ✚ Continuous monitoring
- ✚ Process control
- ✚ Correlated with odour units
- ✚ Networking with high temporal and spatial resolution

An integrated approach is successful for solving a problem of olfactory annoyance

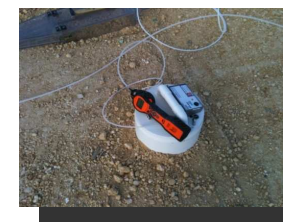
VOC S O D O R



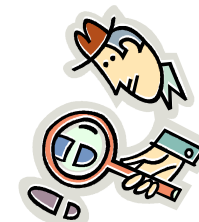
Volatile Organic Compounds characterization (GCxGC - O)



Dynamic olfactometry on site



Networking of sensors/analyzer devices



The best technologies available



*Thank you for your kind
attention*

Magda Brattoli
Chemistry Department - Bari University

magda.brattoli@uniba.it