

## Assessment of odour annoyance by e-nose in the field : some results

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For 5 years, the department "Environmental Monitoring" of F.U.L. has been trying to assess the ability of lab-made electronic noses to measure some environmental odours, if possible directly in the field, and to monitor them continuously. Such an approach should lead to a better understanding of the odour release, by relating it to the process which caused the emission. But the most interesting task of the continuous monitoring of malodour in the field is the real time control of odour abatement techniques.

However, among the potential application areas for electronic noses, the monitoring of our environment constitutes a real challenge.

In the field of environmental monitoring, the background is an ever-changing chemical mixture against which we want to detect the rise of a particular odour - although the exact profile of that rise is unknown and variable [1].

This paper presents some of our research activities regarding the adaptation of the electronic nose principle to measure some malodour sources in the environment, if possible directly in the field [2], and to monitor the odour intensity continuously. The last activity concerns the monitoring of indoor air pollution.

Research aims at the improvement of the portability and the user-friendliness of the instrument, together with testing what kind of signal may be used to monitor the odour.

We have chosen to use metal oxide sensors from the companies "Figaro" and "Capteurs".

Different measurement systems are used. The ambient air is either sampled around environmental sources (landfill, urban waste composting facilities, ...) in Tedlar<sup>®</sup> bags, transferred into the sensor chamber in the lab or in direct contact with the sensors in the field (without flow delivery system).

Data are processed by two commercial software packages (Statistica and Matlab).  
Actually, quantification approach is tested.

In spite of the environmental constraints (temperature and humidity influence [4], wind speed effect, odour variation in nature and in concentration, ever changing background air, interference's, maintenance as low as possible,...), the results are very encouraging.

### References

- [1] GARDNER, J.W., AND BARTLETT, P.N. 1999, *Electronic Noses - Principles and applications*, Oxford University Press, Oxford, 245.
- [2] ROMAIN, A.C., NICOLAS, J., WIERTZ, V., MATERNOVA, J. AND ANDRÉ, PH. 2000, Use of a simple tin oxide sensor array to identify five malodours collected in the field, *Sensors & actuators B*, 62, 73-79
- [3] NICOLAS, J., ROMAIN, A.C., MONTICELLI, D., , MATERNOVA, J., ANDRE, Ph. (2000) Choice of a suitable E-nose output variable for the continuous monitoring of an odour in the environment. *Proceedings of abstracts ISOEN2000 - Brighton - 20-24 July 2000 - 127-128*
- [4] ROMAIN, A.-C., NICOLAS, J., ANDRE, Ph. (1997) In situ measurement of olfactive pollution with inorganic semiconductors : Limitations due to humidity and temperature influence. *Seminars in Food Analysis*, 2, 283-296