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***In situ measurement of olfactive pollution with inorganic semiconductors:
Limitations due to humidity and temperature influence***

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Environment is often mentioned among the numerous applications of electronic noses. However this type of measurement of odour annoyance in the field remains exceptional. Corresponding National regulations consider the olfactometry as the only valid method for evaluation of annoyance and the laws are considered responsible for this lack of interest. Now it's more adequate to impute the responsibility to today's approach of electronic noses, they are not suitable for in situ monitoring (sampling, sensitivity, equipment,...).

In the "Environmental Monitoring" department at FUL (Arlon), research is focused on in situ and real time measurement of pollution elements. The monitoring (discrimination, critical threshold and quantitative analysis) with sensors is part of our targets.

The performances of a multisensor array similar to the one of the e-nose (twelve inorganic semiconductors Figaro trademark) have therefore been tested. Various properties of the sensors, such as drift, interchangeability, power consumption, dependence on external factors, hardiness,... are deeply analysed in order to lead to in situ measurement. So the disadvantages and the limitations of this device were pointed out.

The experiments are first performed in the laboratory in nearly field condition. Synthetic mixtures, as well as real industrial emissions sampled in Tedlar® bags, were passed through the TGS's network.

Present poster shows the influence of external factors on the measurement.

The difficulties linked to the chemical sensors' sensitivity to humidity and temperature are obvious.

In order to avoid them, samples and carrier gas are generally maintained at the same constant humidity and temperature. In the lab, when using liquid or solid samples, it is quite simple to adjust and to stabilise those interferences. But in the case of olfactive pollution assessment, in other words in uncontrollable atmosphere of gases with VOC's concentration below the ppm, a lot of new difficulties, such as humidity and temperature changes, are emerging.

Indeed, the odorous mixture generated by any industrial source may exhibit a water content ranging from near zero to about saturation. Consequently, the semiconductor resistance variation is modified or even reversed.

Results show these disturbances on the electric responses and on the discrimination (PCA, back-propagation). Adaptations to improve in situ measurement are presented by keeping sensors limitations in mind.