Olfactory, chemical and e-nose measurements to characterize odors emission of construct materials for the implementation of the European construction products directive (CPD) on a Belgian level.

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Abstract. Standardization work on test methods for dangerous substances in the field of construction products is currently ongoing at European level in CEN/TC 351 and EOTA PT9. A Belgian research project, with three partners, is going on to optimize current evaluation methods for VOCs (including SVOCs and VVOCs). This project examines also methods for the determination of particle emission from building materials, methods for evaluating the microbial resistance and also methods for odors determination. Different products like flooring materials are placed in three emissions chambers of different sizes (each partner has its own emission chamber) to evaluate their VOC's emission. Chemical analyses are performed by all the partners following the ISO-16000 standard series (by TD-GC-MS). This paper presents first results of ongoing odor measurements with sensory methods and e-nose. Keywords: e-nose, tin oxide sensors, drift, environmental application.
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INTRODUCTION

T research group is equipped with a real size chamber (50 m³). In this Belgian research project, in addition to the VOC's measurements, we are responsible for the odor measurement part.

For fifteen years, our research group "Environmental monitoring" is active in the metrology of malodors in the environment and especially in the development of e-noses for odor environmental real life applications. Olfactometry measurements (for instance with dynamic olfactometer according to the European Standard EN 13725 to measure odor concentration) and chemical analysis are performed in complement of the e-nose technology.

The indoor application has several characteristics similar to the outdoor approach: temperature and humidity variations, complex gaseous mixture, odor character, need of continuous monitoring (the CPD requires a monitoring of the material emissions on 28 days in the emission chamber). But there are two major differences for the odor evaluation: in the indoor community, current methods evaluate the odor intensity of the material more than the odor concentration and the total VOC's concentrations are usually lower than for malodors emitted by industrial, livestock or waste treatment plants.

1. EXPERIMENTAL AND METHODS

This paper presents the different sensorial approaches to characterize odor from construction products. Dynamic olfactometry measurements (to evaluate odor concentration in ouE/m³) and intensity measurements with the comparison to a scale of 5 n-butanol concentrations (dynamic – by a lab-made dynamic system- and static – with vessels following NF X 43-103 Standard) are explained and first results are shown. Chemical analyses of several materials emissions are also exposed.

An e-nose has been developed to monitor the emissions on 28 days. Firstly, experiments are investigated in the lab to test the ability of the metal oxide gas sensors array to discriminate different

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flooring materials, placed in 500 cm^3 glass vessels, with temperature and humidity conditions similar to those of the chamber. For these preliminary tests, the e-nose measurements are realized by cycles of reference air and headspace material samples. After this preliminary step, the e-nose has worked continuously (without reference air cycle) during 28 days with PTFE tubing placed inside the emission chamber and connected directly to the inlet of the e-nose.

2. RESULTS

Sensory results are shown in regard to chemical analyses. First continuous e-nose signals are exposed and PCA analysis is used to explore these first data sets.

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