

ODOR INTENSITY OF A REAL ROOM

Field Evaluation and Laboratory Investigations

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SUMMARY

Odor intensity of indoor environments was assessed by a trained panel and compared to laboratory experiments with bag samples. Differences in intensity ratings and in odor recognition were found. VOC composition confirmed change in the nature of the stimulus. Possible biases are discussed.

INTRODUCTION



Figure 1. Living room.

Odor is strongly related to perceived indoor air quality. However, indoor odor evaluation remains difficult and rarely comparable. In order to improve this last point, two questions are to be answered :

- How to compare odors from different indoor environments ?
- How to faithfully transport odor?

These are the questions we tried to answer through experiments.

The odor intensity of a living room was assessed directly by a trained panel (age 23-34, n = 7-9). A 180 mm linear scale was provided. Two solutions of n-Butanol in water ($2 \cdot 10^{-5}$ and $5 \cdot 10^{-3}$ volumic fraction) were first presented to the panel as the lower and upper limit of the scale. The air from the living room was sampled in PVF Tedlar bags to be assessed 4 hours later with the same method in the sensory laboratory kept at 20 °C.



Figure 2. Sensory Laboratory.

RESULTS

Field Investigations

Odor assessed in the living room was systematically higher than in the meeting room. The initial ratings did not change in three experiments between July and December 2001. Inter-individual differences were low (rsd 23%).

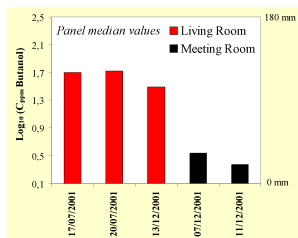


Figure 3. Initial intensity ratings.

Perceived Odor Intensity

Different decrease rates were observed between individuals. Annoyance may account for the lower decrease rate observed in a few subjects (like P5).

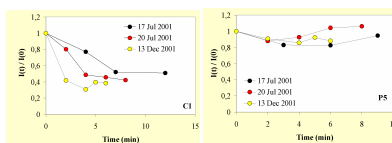


Figure 4. Evolution of the perceived odor intensity.

Field versus Laboratory
 Assessments of Tedlar bag samples were slightly lower than initial ratings in the living room. However, intensity differences remained low for most of the panel.

Moreover, differences in the odor description appeared, that suggested a change in the nature of odor. This assumption was enhanced by chemical analysis of both atmospheres. The differences in VOC concentrations showed a loss of sample (phenylmethanol) and an emission from the Tedlar bag (phenol and N,N-dimethyl acetamide).

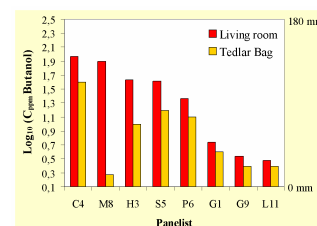


Figure 5. Comparison of initial odor intensity perceived directly (living room) and indirectly (Tedlar bag).

Living Room	Tedlar bag
Carpet	Plastic
Wood	Yellowed paper
Woodwork	Newspaper

Table 1. Semantic odor descriptors.

	Living Room	Tedlar bag
Phenylmethanol	50	9
Phenol	5	300
N,N-Dimethyl acetamide	<1	300

Table 2. Differences in VOC concentration ($\mu\text{g}\cdot\text{m}^{-3}$).

DISCUSSION

In this experiment, odor transport through Tedlar bags did not give the same VOC composition than in the living room. Similarities in intensity ratings were likely due to the addition of background odor from the bag (phenol) along with a loss of the original sample. In the same manner, odor description task could have been influenced by visual recognition of potential sources. It was not possible to determine **what is really evaluated on the field : odor alone or odor linked with context.**

Laboratory experiments can be realized in **controlled conditions** and are therefore essential in order to **compare the odor of environments with different contexts.** This implies however a **more faithful transport** of atmospheres **without loss, adsorption, and emission.**

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