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On the Use of Diffusive Sampling of Volatile Organic Compounds to Assess Indoor Air Quality Complaints

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Summary: *This paper deals with a retrospective discussion of VOC measurements by diffusive sampling in dwellings and their effectiveness to identify and assess the risk associated with IAQ complaints in 12 dwellings and 5 offices. Persistent odour was the major complaint (71%). Identification of VOCs associated with the complaints was found 53% of the time. Results and risk assessment are further discussed.*

Keywords: *diffusive sampling, indoor air quality, complaints, VOC*

1 Introduction

Indoor air quality (IAQ) complaints are increasing whether due to an effective real comfort/health problem or increased awareness. People have increasing demand about the health risk associated with exposure to their indoor environment. Medical doctors have insufficient experience to deal with IAQ complaints. Laboratories are then asked by individuals to measure pollutants in the environment of interest, identify the source if unknown and to provide an expert opinion about whether the environment quality is healthy or not (evaluation exposure). Usually, laboratories are not able to provide investigation assistance due to remote locations. The sending of simple diffusive sampling kits to the individual by post may then provide an effective way to answer IAQ complaints.

This paper deals with a retrospective discussion of several VOC measurements by diffusive sampling in offices and dwellings and their effectiveness to identify and assess the risk associated with IAQ complaints.

2 Methods

The process of complaint evaluation begins as the individual explains by phone, email or letter the nature of the complaint (usually unacceptable odour) to the laboratory expert. Further discussion is sometimes needed to extract critical data (ventilation, nature of building materials, description of perceived symptoms, outdoor environment...).

Minimal analysis expenses are supported by the individual. Expenses act as a filter to differentiate real IAQ problems (in which individuals are ready to pay) from neighborhood complaints (where individuals do not want to pay). Expenses grant the individual power to request effective laboratory implication to solve his problem.

Radiello[®] VOC diffusive samplers [1] packed with Carbograph 4 and sampling directions are sent by post to the individual who will carry out the sampling. Sampling durations are typically between 5 and 7 days. Afterwards, samplers are posted back to the lab. Blank samplers are also returned to take into account possible contamination during transport. Analysis of the samplers is performed by a TurboMatrix ATD (Perkin Elmer) coupled with GC/FID/MS (Autosystem XL / Turbomass - Perkin Elmer). Target VOCs are quantified according to their known uptake rate. Qualitative information is also obtained from identification of other VOC compounds.

3 Results

Seventeen complaints (12 dwellings and 5 offices) have been handled so far. Persistent odour was the major complaint (71%) with sources known 41% of the time. Results are compared to usual concentration levels observed in sleeping rooms [2] and to occupational critical values. Identification of VOCs associated with IAQ complaints was found 53% of the time.

References

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