AIR FRESHNERS EFFECT ON INDOOR AIR QUALITY

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Abstract

In personal and company settings, air fresheners and fragrance oils have become a common commodity. The regular use of air fresheners leads to some chemicals intentionally contaminating the room air. The measurement of the released substances and their effect on indoor air quality was component of the project reported in this paper.

Key words: Air fresheners, indoor, chemicals.

Introduction

Usually most of the fragrance mixtures[1] contain odorous unsaturated hydrocarbons[2], specifically terpenes and terpenoids, which can react to a secondary organic aerosol (SOA) under indoor conditions. Therefore, after adding ozone to the test chambers, the SOA formation potential of some fragrance mixtures was studied by measuring ultrafine particles[3], [4] in chamber air.

Methodology

There were three kinds of diffusers tested: reed stick glass, wooden stopper glass, wooden balls open glass. In accordance with the manufacturer's orders, diffusers were filled / sprayed with the included fragrance liquid. Under defined climatic conditions the diffusers were tested in environmental test chambers: 23 ° C, 50% r.h., having an air exchange rate of 0.5 h-1. The diffusers were held under climatically controlled circumstances between the test cycles. The quantity of volatile substances[5] was calculated in accordance with ISO-16000-6 (sampling was quantified using internal norms based on initial reference substances on Tenax, thermal-desorption GC / MS, solvents and fragrance compounds). To estimate the potential for ozone formation of SOA was added to the chamber three days after the experiment was started. To reflect realistic concentrations, the amount of ozone added was low; the chamber concentration never exceeded 120 µg / m3.

Results

All the diffusers tested in the chamber air result in very elevated levels of solvents and fragrance substances. The different types of diffuser (wood sticks, wood stopper and spray-coated wooden balls) and the fragrance mixture influenced the maximum concentration and time of VOC release.

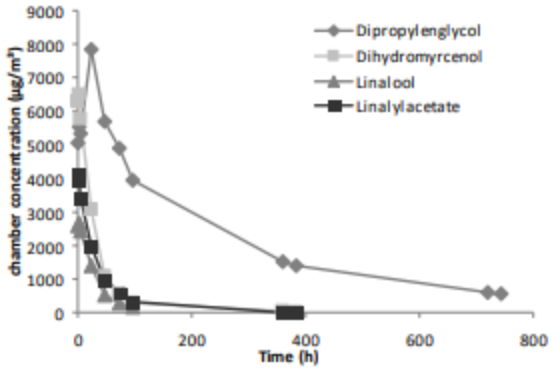

Figure 1: Concentration decay of solvent and fragrances released from a ball diffuser.

In the first hours of the experiment, the free-evaporating wooden ball diffuser showed very elevated levels as seen in Figure 1. After a month, only traces of the perfume substances could be identified, and the primary solvent concentration (dipropylene glycol) was about 500 µg / m3 at the specific given time.

Conclusion

Air fresheners in homes can be significant sources of VOC. The odorless solvents used in the types assessed in this study in particular can reach emission rates of 5 to 10 milligrams per item and hour during the first days of use (or after refilling). The odorless solvents used in the types assessed in this study in particular can reach emission rates of 5 to 10 milligrams per item and hour during the first days of use (or after refilling). It was observed that the emission of unsaturated substances (e.g. limonene) from certain diffuser liquids can lead to room-based SOA generation.

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