



Applications



> Indoor air quality:

Real-time VOCs monitoring in buildings, offices, workplaces, aircrafts, cars...

“SICK BUILDING SYNDROME”

Volatile Organic Compounds (VOCs) are chemicals that evaporate easily at room temperature. Organic refers to carbon-based molecules. Many of which are known to be harmful to human health. Chemical contamination of indoor air is a contributing factor to the so called "Sick Building Syndrome".

VOCs are emitted by normal household products (e.g. air fresheners), construction materials, furniture and many chemicals used in our everyday lives. Some of them come with an odor we experience as an unpleasant smell, whilst others are not perceptible by the human nose.

Indoor air is polluted often stronger than outdoor. This is a serious health concern for people e.g. while working in offices or production plants, traveling in cars or aircrafts and living in polluted buildings.

THE SOLUTION

Successfully addressing the issue of VOC contamination requires solid data and accurate quantification of the relevant compounds that may have an impact on wellbeing often even in very low concentrations.

The IONICON PTR-MS solutions allow monitoring of VOCs continuously online, display real-time results and are sensitive to substances with detection limits < 1 pptv.

PTR-MS

- > Real-time monitoring of most common VOCs responsible for smells
- > Very low detection limit: < 1 pptv
- > Accurate quantitative method, without sample preparation or waiting time
- > Complex matrix of substances can be analyzed without restrictions

Find out more:

www.PTRMS.com/applications



STUDY OF AIR FRESHENERS WITH PTR-MS

Commercially available air fresheners were applied in a closed 20 m² room with no ventilation for three seconds each. One “household” type air freshener intended for removing malodors from homes as well as a product designed for industrial applications was used.

IONICON PTR-MS has a very short response time (< 100 ms), thus a very high time-resolution and therefore is an ideal tool for dynamic profiling of low concentrated VOCs.

RESULTS

An interesting finding we can report is that the concentration of disinfectants in the industrial air freshener is much higher than the household product’s level and the agent used differs. The same is true for the fragrances used and our measurements have shown that the fragrance design of the household product is more complex.

FIGURES

Figure 1 shows a dynamic profile of selected substances from the household air freshener in a closed room after a three seconds application to the room air.

Figure 2 shows a dynamic profile of selected ingredients of the industrial air freshener. Noteworthy here is the higher intensity and longer presence in room air compared to the household type product.

Figure 3 illustrates a comparison of key substances and relative concentrations for both products. The industrial air freshener has a much higher concentration of disinfectant agents and a less complex fragrance formula dominated by C₁₀H₁₆.

In **figure 4** the very high time resolution of PTR-MS is demonstrated by inserting the inlet into a confined area where the household air freshener was applied. After 30 seconds the inlet is removed.

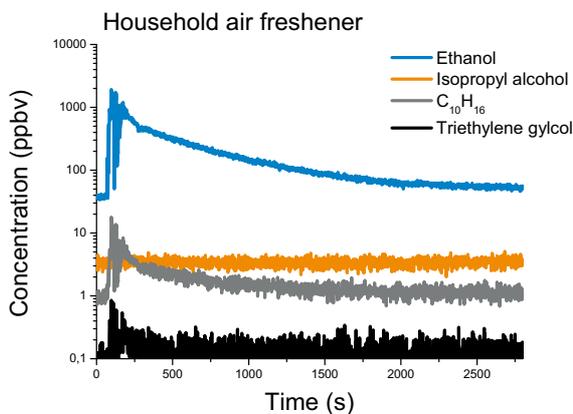


Fig. 1: Dynamic VOC concentration profile of household air freshener.

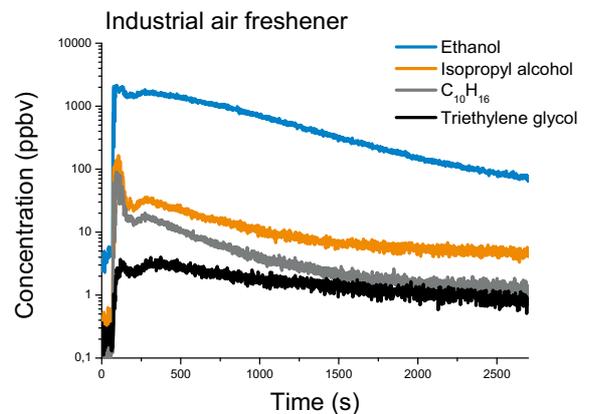


Fig. 2: Dynamic VOC concentration profile of industrial air freshener.

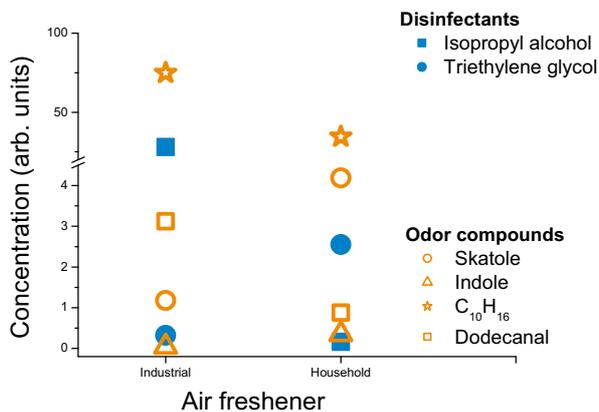


Fig. 3: Key disinfectant and fragrance compounds in relative concentration.

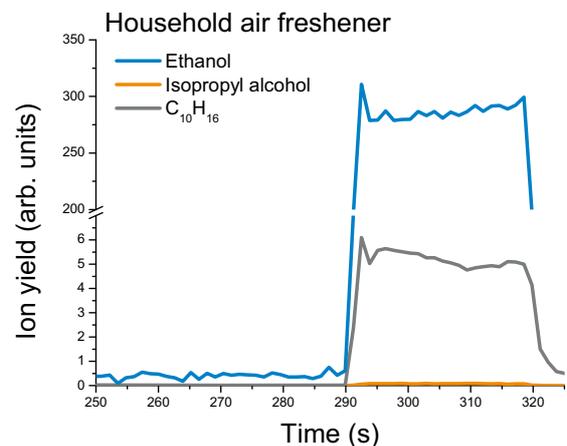


Fig. 4: High time resolution of PTR-MS demonstrated in confined area.