

# **Understanding Volatile Organic Compounds (VOCs) and Microbial VOCs (mVOCs): A Guide to Indoor Air Quality**

Volatile Organic Compounds (VOCs) and their microbial counterparts, mVOCs, play a pivotal role in our environment and health, especially within indoor spaces. VOCs, originating from various materials and substances, alongside mVOCs, produced by microbes such as bacteria and moulds, significantly impact indoor air quality (IAQ). This guide explores the significance, sources, and management of VOCs and mVOCs, highlighting their effect on human health and well-being.

## **The Language of Life: VOCs and mVOCs**

VOCs are not just chemical emissions; they represent a form of communication between living organisms, including humans, who use pheromones as a means of attraction. mVOCs, on the other hand, are the microbial world's contribution to this chemical dialogue, emanating from bacteria and mold. These compounds are essential indicators of biological processes and can signal the presence of underlying health risks in our environments.

## **Indoor Air Quality and VOCs: Signals of Concern**

Indoor air quality is directly affected by the presence of VOCs and mVOCs, which can indicate biological amplification or the off-gassing of materials, often observed in new or moist substances. Common sources include manufactured materials such as Medium-Density Fiber board (MDF), fabrics, Oriented Strand Board (OSB), treated timbers, furniture, paints, air sprays, and deodorizers. These sources, among others, contribute to indoor air pollution, potentially leading to long-term health issues through chronic exposure.

## **Exposure and Health Risks: Understanding the Impact**

Although maximum exposure levels exist, they are primarily based on occupational standards, assuming an 8-hour exposure for healthy workers. However, building occupants may experience continuous exposure, raising concerns about unknown synergistic effects from various contaminants. It underscores the necessity for comprehensive VOC sampling to safeguard health and ensure a healthy indoor environment.

## **VOC Sampling: Techniques and Technologies**

VOC sampling is crucial for maintaining a healthy workplace and complying with health and safety legislation. Various methods are available, ranging from air capture and analysis to portable labs that detect significant chemicals in parts per billion (ppb) or parts per million (ppm). Techniques such as infrared gas chromatography

offer rapid results, while grab sample analysis provides insights over extended periods. Each method offers essential data, with cost and time being the primary considerations.

### Innovations in VOC Detection: The Role of AI

The advent of AI-powered robots marks a significant advancement in VOC sampling, enabling comprehensive assessments of potential health risks and environmental triggers. Equipped with state-of-the-art technology and supported by leading laboratories, these innovations facilitate precise VOC identification and risk assessment, helping to ensure healthier indoor environments.

## Conclusion

Understanding and managing VOCs and mVOCs are crucial for maintaining optimal indoor air quality and safeguarding health. With advanced sampling methods and technological innovations, it is possible to identify and mitigate the risks associated with these compounds, ensuring safer indoor spaces for all occupants.

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