

WHY DOES INDOOR CHEMISTRY MATTER?

People spend most of their time at home or in other indoor locations, and complex mixtures of chemicals in indoor environments may adversely impact indoor air quality and human health.

A consensus study report of the National Academies, *Why Indoor Chemistry Matters*, identifies gaps in current research and understanding of indoor chemistry and new approaches that can be applied to measure, manage, and limit chemical exposures.

MANAGING CHEMICALS IN INDOOR ENVIRONMENTS

Approaches to manage chemical contaminants in indoor environments include removal and chemical transformations.



Removal Approaches

- Filtration
- Physical cleaning
- Passive surface removal
- Sorption
- Ventilation



Chemical Transformations

- Photolysis
- Photocatalysis
- Chemical additions
- Ionizers



CHALLENGES IN IDENTIFYING CHEMICAL SOURCES

Techniques to identify new chemicals that may be released into the indoor environment are both costly and time-consuming. **Chemical partitioning** and **chemical transformations** present a high degree of complexity in the understanding of indoor chemistry.



Partitioning determines the concentration of a chemical in air, on surfaces or elsewhere and results in the distribution of chemicals from their initial sources throughout indoor spaces.



Chemical transformations lead to the loss or removal of certain substances and the generation or formation of new substances. The products that arise from these reactions frequently have different properties, including their partitioning behavior and toxicity.

EXPOSURE

Exposure routes include inhalation, ingestion, and dermal uptake. Exposures to indoor chemicals may result in adverse health effects. The likelihood of adverse health effects is influenced by variables such as:



Exposure duration



Inherent toxicity of the chemical mixture



Chemical concentrations in the environment



Route of exposure



Susceptibility of the person

A PATH FORWARD

Further research is needed about the chemical transformations that can occur indoors, pathways and timing of indoor chemical exposure, and the cumulative and long-term impacts of exposure on human health.

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