



Microbial Volatile Organic Compounds

It has been shown that certain microorganisms produce characteristically unique microbial volatile organic compounds also known as MVOCs. The odors that microorganisms produce may be attributable to distinct MVOCs produced by certain species of microorganisms.

Microorganisms grown in the laboratory may produce different MVOCs than those that grow wild in building material substrates. mVOC production can be highly variable depending on growing conditions such as substrate, temperature, and competition from other microorganisms.

MVOCs from fungi and bacteria have been shown to penetrate plastic vapor barriers used in current home construction.

VOCs can also originate from non-living sources due to the fact that some VOCs are used as common solvents for the home, office and in industry. MVOCs can also be common compounds found in cleaners, paints, adhesives, and gasoline. There are many indoor VOC sources other than microorganisms such as paints, varnishes, cleaning materials, solvents, fabrics, carpets, plastics, building materials, and indoor combustion.

There are two main methods for the collection of MVOCs. The first is a collection of a whole air sample in a stainless steel sampling vessel such as a SUMMA canister or mini-can. The air sample is sampled easily at the client's home or office and shipped to the laboratory for subsequent analysis by cryogenic preconcentration coupled with GC/MS (TO-15). The second method is to collect the air sample on a solid sorbent contained in a glass tube. The sorbent tubes are available commercially from SKC and other vendors. One difficulty with this method is that the MVOC compound must be matched with the appropriate sorbent and desorption solvent.

MVOC Collection Strategies

Whole Air

When using the whole air sampling method, atmospheric moisture should be relatively low. High concentrations of moisture can impact the cryogenic concentration process and present difficulties with the GC/MS analysis. In situations where noticeable odors are present, whole air analysis may be appropriate. Also, if a broad spectrum 'unknown' GC/MS scan of MVOCs is desired, the whole air analysis approach can be a useful analytical tool. The information obtained will traverse many different types of organisms and provide useful qualitative MVOC information. Also, the whole air analysis will provide general health-related exposure information.

Sorbent Tube Collection

When using the sorbent tube method, it would be useful to know what the target organism is. The MVOCs that are currently analyzed originate from AsPen species.