



Engineering Sciences Section – 2008

C34 The Analysis of Microbial Volatile Organic Chemicals From Mold Using Air Canisters and Gas Chromatography Mass Spectrometry

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The goal of this presentation is to discuss sampling and analysis of mold microbial volatile organic chemicals.

The presentation will impact the forensic science community by demonstrating the analysis of microbial VOCs with an air canister and GC-MS.

Hurricanes and other events that cause flooding, as well as high humidity environments, lead to mold growth in houses and other building structures. Because the presence of mold can be harmful to human health (leading to a version of sick building syndrome) and its visual detection is not always possible analysts are turning to alternate ways to detect its presence, including chemical detection with gas chromatography – mass spectrometry (GC-MS). Mold produces volatile organic chemicals (VOCs) that in addition to giving a characteristic musty odor can be used to indicate its growth or perhaps even to fingerprint the type of mold. Geosmin and 2-methylisoborneol are well-known “earthy” smelling microbial VOCs, but there are a wide variety of other components representing alcohol, ketone, furan, and other mainly polar functionalities.

Because of their polarity and what may be very low concentrations of the compounds in a home, an inert and large volume collection device is needed for sampling. Air canisters that have been passivated are ideal for sampling microbial VOCs. VOC introduction is via a preconcentrator to a GC-MS for qualitative and quantitative determinations.

This paper will show the analysis of microbial VOCs with an air canister and GC-MS. Reference standards of microbial VOCs will be used to develop methods followed by “real world” sample analysis from homes with mold problems. The importance of proper deactivation of the air canister and other sample introduction equipment will be discussed.

Air Sampling, Microbial Volatile Organic Chemicals, Gas Chromatography - Mass Spectrometry