

## Headspace analysis and quantitation of problematic volatile species by Solid Phase Micro-extraction (SPME) and other methods



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There are a number of cases in both forensic and environmental research in which analysis of volatile headspace components above a sample is important. However, analytical headspace methods are often limited for some analytes due to inherent properties, making them difficult to detect. Additionally, methods of quantitation are limited for common headspace analysis techniques such as solid phase micro-extraction (SPME). In this study, several vapor-sampling methods were developed first for the quantification of derivatized ammonia by GC/MS analysis. A passive sampling method using SPME and an active sampling method using a PTV (programmed temperature vaporization) cryotrap inlet achieved detection limits in the parts-per-billion range. Similar methods using were applied to other analytes, such as vaporous chlorine. Quantification was tested using methods for both static sampling, using an externally sampled internal standard, and dynamic, whole air extractions. This presentation will discuss the limitations in quantification for SPME analyses, as well as recent advances achieved by the Naval Research Laboratory to overcome such challenges in detection and quantitation of problematic volatile species.

# MCI

## *Topics in Museum Conservation*

**September 6, 2018**  
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*MCI Theater*  
MUSEUM SUPPORT CENTER  
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