

USE OF SILCOCAN CANISTERS FOR STORING LOW-LEVEL (1PPB-20PPB) REACTIVE SULFURS IN AIR

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Analysis of sulfur-containing volatile organic compounds (VOCs) such as hydrogen sulfide (H_2S), methyl mercaptan (CH_3SH), ethyl mercaptan ($\text{C}_2\text{H}_5\text{SH}$), and dimethyl disulfide (CH_3SSCH_3) has become important because of health concerns and complaints about odors near manufacturing sites and refineries. Collection and measurement of these compounds in the atmosphere is very difficult because of their low concentrations and high reactivity. These sulfur compounds can react not only with each other, but also with the vessels in which they are collected, resulting in low recoveries. Tedlar® bags traditionally have been used for collecting sulfur VOCs; however, the stability of low-level ($\leq 100\text{ppbv}$) sulfur VOCs is poor, even within 24 hours of sampling.¹ Electropolished canisters (e.g., SUMMA® canisters) are excellent for storing VOCs in ambient air, but sulfur compounds react with the metal surface, making these canisters unsuitable for collecting and storing low-level sulfur VOCs.² SilcoCan™ air monitoring canisters, which feature a Silcosteel® treated surface, greatly increase the storage stability of low-level sulfur VOCs. This study is twofold. The purpose of Experiment 1 was to demonstrate the suitability of SilcoCan™ canisters for storing very low levels (1-20ppbv) of reduced sulfurs. This was accomplished by quantifying several sulfur compounds daily during storage in SilcoCan™ canisters. Experiment 2 was designed to study the effects of various canister cleaning processes on subsequent suitability of the canisters for storing sulfur compounds.