

Testing for Methane, Ethane and Ethene in Water by Headspace Analysis Utilizing Method 3810 modified

Application Overview

Ground water samples are often collected and analyzed for the dissolved gases; Methane, Ethane and Ethene. These compounds are some times referred to as natural attenuation compounds, as they are by-products of naturally occurring bacteria that inhabit ground water. Water contaminated with chlorinated solvents or petroleum products can be evaluated using this sampling strategy. The goal is to determine if site clean up can be achieved naturally over time by the action of these naturally occurring bacteria. Typically this procedure involves collecting, in triplicate, approximately 10 mls of sample in a 20-ml headspace vial. Henry's Law stipulates that in a closed system the concentration of a gas in the headspace can be used to determine the concentration of the gases dissolved in water.

Detection/Reporting Limits

Actual detection limits achieved by Method 3810 will vary slightly with the amount of sample collected. Method validation is performed using 10 mls of sample. Actual amounts sampled will vary. The following table summarizes reporting limits based on a 10 ml sample:

Compound	Reporting Limit
Methane	10 ug/L
Ethane	20 ug/L
Ethene	20 ug/L

Method Specifications

Method Holding Time: - Analyzed within 14 days of collection

** Holding time applies to preserved sample (pH <2) unpreserved samples should analyzed within 7 days of collection.*

Method Turnaround (TAT): - 10 working days

Method QAQC:

- ICAL performed as specified by the method
- Continuous calibration monitored daily or every 10 samples
- Lab Blank/Batch (maximum 20 samples)

Sampling Guidelines

Each sample kit contains the following: three 20 ml headspace vials, 3 Aluminum caps with Teflon® inserts, 1 Cap "crimping-tool", labels, chain of custody, a small vial with lab grade (1:1) Hydrochloric Acid and a dropper. Fill each 20 ml headspace vial with 10 mls of sample (approx. 50% full), then add a few drops of (1:1) Hydrochloric Acid. Seal each vial with Cap and Teflon® liner by placing the crimp-tool over the cap and squeezing firmly. Repeat this procedure for each of the three vials per sample. Check caps to ensure they are sealed. Ship samples via overnight carrier, chilled to 4°C (39°F), and include completed chain of custody document and crimping tool.