



VOLATILE ORGANIC COMPOUNDS WATER SAMPLING

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Preservation of drinking water or chlorinated water is intended to ensure that collected sample remain representative, such that target analytes do not degrade or generate.



Problematic of VOC

- Affect the environment and human health
- Most VOCs result from human activity
- Exposition through the air, skin contact, food, drinking water
- Some VOCs are carcinogenic or suspected to be
- Compounds with boiling point from 56.5 °C
- VOC leak very easily during samples manipulation

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The two most common examples of VOCs that require preservation are:

- Benzene, toluene, ethylbenzene, and xylenes (BTEX) and other aromatics as they are highly susceptible to rapid degradation in the presence of certain common bacteria.
- Trihalomethanes (THM) which are byproducts of chlorination, and form through the reaction of free chlorine with residual organic matter in chlorinated water supplies.



Sample Containers & Preservatives

The right vial

- Glass vial with screw cap and PTFE septum (ALS vial).

The right volume

- Full vial fulfilled without headspace.
- Any headspace in the vial means loss of VOC and leads to biased results.
- Two 40 ml vials fully filled are needed.
- A second fully filled vial without headspace is required in case of dilution or re-analysis. This procedure is the proper way to ensure right VOC results.

The right preservation

The different types of water are preserved the following manner (based on ISO 5667-3):

Water	Volume/Sampler	Preservation	Temperature
Drinking water	2 x 40 ml ALS vial without headspace	Na ₂ S ₂ O ₃ (50 mg per litre) * Na ₂ S ₂ O ₃ · 5H ₂ O (80 mg per litre) **	1 – 5 °C
Other chlorinated water (pool, hot water, etc.)	2 x 40 ml ALS vial without headspace	Na ₂ S ₂ O ₃ (50 mg per litre)* Na ₂ S ₂ O ₃ · 5H ₂ O (80 mg per litre) **	1 – 5 °C
Underground water	2 x 40 ml ALS vial without headspace	None	1 – 5 °C
Surface water	2 x 40 ml ALS vial without headspace	None	1 – 5 °C
Waste water	2 x 40 ml ALS vial without headspace	None	1 – 5 °C

* Sodium thiosulfate provided by ALS Czech Republic

** Sodium thiosulfate pentahydrate can be used alternatively



The presence of free chlorine leads to creation of chlorination products and products of radical's reaction, named trihalomethanes (THM). Organic compounds, such as humic acids and fulvic acids, react with free chlorine to form chloroform, bromodichloromethane, dibromochloromethane, bromoform and other compounds.

Sodium thiosulfate clearly reduces free chlorine and stops any further formation of trihalomethanes after sampling. The addition of this preservative in right amount (as mentioned in ISO 5667-3) is suitable in order to obtain more objective and reliable results. A dehalogenation of the compounds also occurs if more thiosulfate is used!

The right sampling

All VOC vials provided by ALS for drinking water and other chlorinated water will contain sodium thiosulfate. It is therefore important to apply the following guideline:

- Label ALS vials with the appropriate sample identification. Do not cover the bar code!
- Do not rinse the vial with the water to sample
- Fill the container with water until the vial is full
- Cap tightly (screw) and ensure that no headspace is present
- Shake briefly to dissolve the preservative
- Collect samples in duplicate
- Pack samples at temperature between 1 to 5°C before shipping to ALS Laboratory

Major advantages

- Readiness to use: elimination of manipulation with water – minimum loss of VOCs.
- Reduced time for sampling
- Easiness for sampling points with low water yields
- More reliable results, namely for chlorinated waters
- Reduced weight of refrigerated boxes when full
- Reduced transport costs

Do not hesitate to contact us to beneficiate from this service.

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