Investigation of the Suitability of Dispersive Liquid-Liquid Microextraction with **GC-MS to Determine Haloacetic Acids in Real Samples**



- chlorinated species interact¹
- main variants seen in Figure 1
- human carcinogens"²
- with a lengthy extraction and derivation process.³
- year.⁴
- of the five HAAs listed prior, which is 80ppb.⁵



- Add 4 mL of acid-salt sample to vial

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Table 1: GC-MS instrument parameters

Inlet temperature	200°C
Ion source temperature	200°C
Carrier gas flow rate	2 ml /min
Carrier dae proceuro	50 kPo
Carrier gas pressure	SUKFa
Injection volume	0.2 µL
Pre-washes with octanol	2
Post-washes with octanol	2
Temperature and hold #1	40°C for 1 minute
Ramp rate #1	25°C/min
Temperature and hold #2	180°C for 4 minutes
Ramp rate #2	30°C/min
Final temperature and hold	250°C for 2 minutes
Solvent delay	5.7 minutes
SIM	79, 95, 48, 76, 121, 123, 139, 36,
	110, 127, 129, 131, 120, 122, 173
Scan range	35-230

Table	2:	НАА	con
Table	۷.		CON

Hot Tubs	MBAA (ppm)
Hot Tub 1	106.2
Hot Tub 2	16.62
Table 3: HA	Acon
Swimming Pools	MBAA (ppm)
Pool 1	ND
Pool 1 Pool 2	ND ND
Pool 1 Pool 2 Table 4: HA	ND ND
Pool 1 Pool 2 Table 4: HA Tap Water	ND ND AA con MBAA (ppm)
Pool 1 Pool 2 Table 4: HA Tap Water Aberdeen	ND ND AA cone MBAA (ppm) 2.664

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https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=901V0400.txt (accessed 2024-02-20). 4) City of Kamloops Facility Number 0660340, City of Kamloops Drinking Water Annual Report 2023, 2024. https://www.kamloops.ca/sites/default/files/2024 07/2023%20IH%20Drinking%20Water%20Report.pdf 5) Federal-Provincial-Territorial Committee on Health and the Environment, Federal-Provincial Territorial Committee on Drinking Water. Guidelines for Canadian Drinking Water

Quality Guideline Technical Document. Haloacetic acids. 2008.



ncentrations for Spa samples

DCAA (ppm)	TCAA (ppm)	BCAA (ppm)	DBAA (ppm)
13.70	22.68	13.55	19.82
2.734	4.081	24.81	5.490

ncentrations for Pool samples

DCAA (ppm)	TCAA (ppm)	BCAA (ppm)	DBAA (ppm)
ND	ND	ND	ND
0.611	1.325	0.992	2.029

ncentrations for Tap samples

DCAA (ppm)	TCAA (ppm)	BCAA (ppm)	DBAA (ppm)
5.131	14.816	81.410	8.569
3.625	9.322	4.402	5.599

Acknowledgements

References

Method 552.3. Determination of Haloacetic Acids and Dalapon in Drinking Water by LiquidLiquid Microextraction, Derivatization, and Gas Chromatography with Electron Capture

https://health.canada.ca/publications/healthy-living-vie-saine/water-haloacetichaloacetique-eau/alt/water-haloacetic-haloacetique-eau-eng.pdf (accessed 2024-02-20).