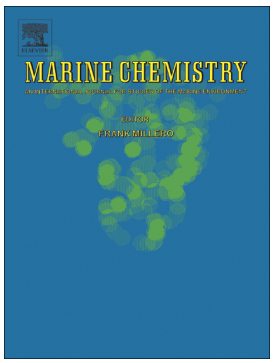

Optimization and measurement uncertainty estimation of hydride generation–cryogenic trapping–gas chromatography–cold vapor atomic fluorescence spectrometry for the determination of methylmercury in seawater

Igor Živković, Vesna Fajon, Delali Tulasi, Kristina Obu Vazner, Milena Horvat

PII: S0304-4203(17)30074-9
DOI: doi: 10.1016/j.marchem.2017.03.003
Reference: MARCHE 3433

To appear in: *Marine Chemistry*

Received date: 6 July 2016
Revised date: 1 March 2017
Accepted date: 2 March 2017

Please cite this article as: Igor Živković, Vesna Fajon, Delali Tulasi, Kristina Obu Vazner, Milena Horvat , Optimization and measurement uncertainty estimation of hydride generation–cryogenic trapping–gas chromatography–cold vapor atomic fluorescence spectrometry for the determination of methylmercury in seawater. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Marche(2017), doi: 10.1016/j.marchem.2017.03.003

Optimization and measurement uncertainty estimation of hydride generation–cryogenic trapping–gas chromatography–cold vapor atomic fluorescence spectrometry for the determination of methylmercury in seawater

Igor Živković[a,b], Vesna Fajon[a], Delali Tulasi[b], Kristina Obu Vazner[b], Milena Horvat[a,b,*]
[a] Department of Environmental Sciences, Jožef Stefan Institute, Jamova cesta 39, SI-1000 Ljubljana, Slovenia
[b] Jožef Stefan International Postgraduate School, Jamova cesta 39, SI-1000, Ljubljana, Slovenia
* Corresponding author: milena.horvat@ijs.si

Abstract
This technical note presents optimization results of hydride generation volatilization coupled with cryogenic trapping, separation by gas chromatography and detection by cold vapor atomic fluorescence spectrometer after pyrolysis. Method performance was compared with the reference ethylation method and results from a previous study. Using GUM/Eurachem guidelines, we estimated expanded relative standard uncertainty (k = 2) of both methods. Expanded relative standard uncertainty was 11.1%, 15.0% and 21.3% for hydride generation, and 15.8%, 18.2% and 19.3% for ethylation, at the highest (>400 fM), middle (100–150 fM) and lowest (<50 fM) methylmercury concentration levels, respectively. Sample repeatability represents the biggest single contribution to the expanded standard uncertainty in hydride generation, together with recovery in ethylation method.

Keywords: *methylmercury, hydride generation, ethylation, uncertainty estimation*