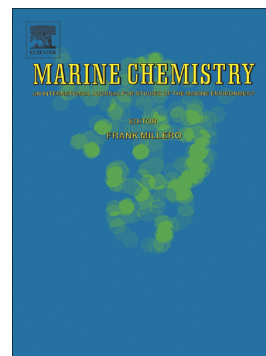


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Optimization and measurement uncertainty estimation of hydride generation–cryogenic trapping–gas chromatography–cold vapor atomic fluorescence spectrometry for the determination of methylmercury in seawater

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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*

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