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PII: S0039-9140(18)30787-2  
DOI: <https://doi.org/10.1016/j.talanta.2018.07.079>  
Reference: TAL18908

To appear in: *Talanta*

Received date: 19 April 2018  
Revised date: 22 July 2018  
Accepted date: 24 July 2018

Cite this article as: Jana Farell and Dirk Wallschläger, Determination of Se<sub>8</sub> in Sediments by Gas Chromatography-Mass Spectrometry, *Talanta*, <https://doi.org/10.1016/j.talanta.2018.07.079>

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**Determination of Se<sub>8</sub> in Sediments by Gas Chromatography-Mass Spectrometry**

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**Abstract**

A gas chromatography-mass spectrometry (GC-MS) method was developed to analyze cyclooctaselenium (Se<sub>8</sub>) in sediments after extraction with carbon disulfide (CS<sub>2</sub>). The method suffers from some analytical complications, most notably a poor peak shape for Se<sub>8</sub>, manifesting in a broad peak (2 min) with strong fronting, and a decrease in Se<sub>8</sub> retention time with decreasing concentration. Detailed analysis of the mass spectral data suggests that (thermal) decomposition of Se<sub>8</sub> on the GC column is responsible for both of these phenomena. Despite these limitations, GC-MS with selected ion monitoring (SIM) yielded a sufficiently low detection limit, 10 µg/kg (dw), to analyze Se<sub>8</sub> in selenium-impacted sediments. The CS<sub>2</sub> extraction appears to be selective enough to allow the determination of Se<sub>8</sub> in sediments without further cleanup when GC-SIM-MS is used for analysis. One selenium-impacted sediment contained 7.1 mg/kg (dw) Se<sub>8</sub>, corresponding to 41 % of its total selenium and as much as 50 % of its total elemental selenium.

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