Determination of chloroparaffins in sediments by high resolution gas chromatography coupled to mass spectrometry with different ionization techniques

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Chloroparaffins (CPs or polychlorinated n-alkanes) are the most complex halogenated contaminant mixtures. The total number of congeners is unknown but far exceeds 10` 000 single compounds.(1) The separation of individual compounds cannot be accomplished by capillary gas chromatography (GC). CP chromatograms normally show a big hump with more or less unresolved peaks. Most quantitative methods are based on GC combined with high and low resolution mass spectrometry (MS) despite some limitations (2). Detection of CPs by MS often involves electron-capture negative ionisation (ECNI) due to its high selectivity and sensitivity. The applicability of HPLC-APCI(-)-LRMS and GC × GC-ECNI-TOF-MS was also recently demonstrated (3, 4).

Additionally, two further GC-MS methods were developed in our research group in the past 2 years (HRGC-EI-MS/MS and HRGC-NICI-MS). Their comparability to HRGC-ECNI-HRMS was shown5. CP concentrations were determined in sediments from the North and Baltic Sea by HRGC-LRMS with the three different ionization techniques. The benefits and drawbacks of each technique will be discussed. Total CP concentrations ranged between 5-377 ng/g dry weight. The Baltic Sea seemed to be higher contaminated than the North Sea6.

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