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Determination of Butyltin Species in Seafood Samples by Ultrasonic Probe extraction and Isotope Dilution Analysis by GC-MS

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Organotin compounds are among the most widely used organometallic chemicals. Tributyltin (TBT), mainly introduced to marine environment through leaching from antifouling paints applied on ship hulls, has received much attention since it presents adverse effects on aquatic ecosystems. Furthermore, the less toxic derivatives dibutyltin (DBT) and monobutyltin (MBT) are also of environmental concern.

In the present work a new simple methodology for the determination of TBT, DBT and MBT in seafood samples is reported. The method is based on the use of an ultrasonic probe for the extraction of butyltins from the sample and sodium tetraethylborate derivatization, both allowing the reduction of handling time to minutes. Isotope dilution analysis is used for the determination of concentration in the extract using ^{119}Sn enriched species and GC-MS. The accuracy of the proposed method was tested on spiked real samples and on two reference materials, NIES-11 and CRM-477, fish and mussel tissue respectively. The developed method was applied to different seafood samples, fish and bivalves, from the Mar Menor (Spain) obtaining concentrations in the range 8.4-1000 ng Sn g^{-1}, 4.7-550 ng Sn g^{-1} and 3.5-540 ng Sn g^{-1} for TBT, DBT and MBT respectively.