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OPTIMIZATION OF THE DETERMINATION METHOD FOR DISSOLVED CYANOBACTERIAL TOXIN BMAA IN NATURAL WATER

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There is a serious dispute on the existence of β-N-methylamino-L-alanine (BMAA) in water, which is a neurotoxin that may cause amyotrophic lateral sclerosis/Parkinson's disease (ALS/PDC) and Alzheimer' disease. It is believed that a reliable and sensitive analytical method for the determination of BMAA is urgently required to resolve this dispute. In the present study, the solid phase extraction (SPE) procedure and the analytical method for dissolved BMAA in water were investigated and optimized. The results showed both derivatized and underivatized methods were qualified for the measurement of BMAA and its isomer in natural water; limit of detection and the precision of the two methods were comparable. Cartridge characteristics and SPE conditions could greatly affect the SPE performance, and the competition of natural organic matter is the primary factor causing the low recovery of BMAA, which reduced from approximately 90% in pure water to 38.11% in natural water. The optimized SPE method for BMAA was a combination of rinsed SPE cartridges, controlled loading, elution rates and elution solution evaporation at 55°C, reconstitution of a solution mixture and filtration by polyvinylidene fluoride membrane. This optimized method achieved > 88% recovery of BMAA in both algal solution and river water. The developed method can provide an efficient way to evaluate the actual concentration levels of BMAA in actual water environments and drinking water systems.

Biography

Boyin Yan is a Doctoral candidate in School of Municipal and Environmental Engineering, Harbin Institute of Technology (HIT), China. She attained a Bachelor's degree from HIT. Her major is Environmental Engineering and her research focuses the study of cyanobacterial toxins in eutrophic water such as developed effective determination methods for new cyanobacterial toxins, the detection of cyanobacterial toxins in eutrophic water and the removal of cyanobacterial toxins. Until now, she has published one paper as first author in foreign journal.

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