

Determination of Perfluorocompounds in Seafoods by a Novel Fast Extraction technique coupled with LC-MS/MS

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Abstract

Perfluorocompounds (PFCs) are persistent organic pollutants that have been detected in various environmental matrices, including seafood. Their bioaccumulation potential and adverse effects on human health necessitate accurate and sensitive analytical methods for their determination. In this study, a novel fast extraction technique, Fast Perfluoro Extraction (FaPEX), coupled with liquid chromatography-tandem mass spectrometry (LC-MS/MS), was developed for the determination of eight selected PFCs in six seafood samples. The optimized FaPEX method demonstrated excellent extraction efficiency, minimal matrix interference, and short extraction times. Calibration curves were constructed for each target compound from 10 ppb to 500 ppb to achieve excellent linearity ($R^2 = 0.992$ to 0.999). The FaPEX-LC-MS/MS method exhibited robust and impeccable analytical performance, including low limits of detection (LODs) and quantification (LOQs), good precision, accuracy, and recovery rates for all eight PFCs. The FaPEX-LC-MS/MS method on application to the analysis of the seafood samples revealed the presence of the targeted PFCs in detectable concentrations. The results of this study corroborate the applicability and effectiveness of the FaPEX-LC-MS/MS method for the determination of 8 PFCs in seafood samples. Therefore, this research emphasizes the importance of monitoring and regulating PFCs levels in seafood to ensure food quality assessment and consumer safety.

Keywords: PFAs; Sea food analysis; Food quality assessment; Rapid extraction