
ANALYSIS OF PERSISTENT ORGANIC POLLUTANTS BY MODULAR PRESSURIZED LIQUID EXTRACTION WITH IN-CELL CLEAN-UP AND FRACTIONATION

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Pressurized liquid extraction (PLE) is a common technique to extract persistent organic pollutants from solid samples at elevated temperature and pressure. The exhaustive nature of PLE makes the extraction highly efficient; but less selective because of rich co-eluted materials, thus requires a tedious costly removal. To reduce cost and time consuming, a modular PLE was developed to analyze polychlorinated biphenyls (PCBs), polychlorinated dibenzo-*p*-dioxins and dibenzofurans (PCDDs/Fs). Using in-house designed adaptors a 22 ml upper cell packed with sample and 40% sulphuric acid on silica was coupled to an 11 ml downstream cell with activated carbon on Celite. Two extraction sequences were performed. In the first sequence, the sample was extracted, co-eluted organic matters was digested by the sulphuric acid, and non-*ortho* PCBs and PCDDs/Fs were captured by the activated carbon trap (while the di-tetra-*ortho* PCBs passed through). After uncoupling the modular PLE, the 11 ml cell was extracted with toluene to elute the non-*ortho* PCBs and PCDDs/Fs. Different matrices were deployed in this strategy to optimize the PLE efficiency. Additionally, an attempt was made to replace dichloromethane with diethylether in the first sequence. Recoveries of the *ortho* PCBs depended on the carbon content of the trap. High carbon content traps retained non-*ortho* PCBs and PCDDs/Fs, while low carbon content traps only retained PCDDs/Fs. The modular design, the optimization of the solvent composition, carbon amount, proportions of carbon and Celite, etcetera, as well as, the method validation will be presented.