



## Can Shells be Biomonitor of Contaminants in the Environment: an Investigation Study of Perfluorinated Compounds in Bivalve Shells of China

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To assess the feasibility of using biominerals to biomonitor the extent of persistent contaminants in the environment, concentrations of perfluorinated compounds (PFCs), including perfluorinated carboxylic acids (PFCAs) and perfluorinated alkylsulfonates (PFASs), in the bivalve shells of clams, razor clams, oysters and mussels sampled from 8 sampling sites along China coast were analyzed. Concentrations of these contaminants in the waters and sediments of the sampling sites, as well as in the soft tissues of clams were also determined. Results show that though the concentrations of most PFCs in shells were lower than in soft tissues, the amount of contaminants in shells and soft tissues of bivalves are comparable, due to the larger dry-weight of shells than soft tissues of these animals. Concentrations of some PFCs in shells primarily correlate to concentrations in sediments, while concentrations in the soft tissues seems to be more related to those in water samples. We suggested that shells uptake PFCs by adsorption or passive deposition of the target chemicals to the shell organic matrix followed by a biomineralisation process. Therefore, contaminants bound to the organic matrix in the shell microstructure are sequestered and hard to release. Like soft tissues, biominerals, e.g. shells, might also be considered as biomonitoring matrix for some contaminants in environments, because (i) the individual differences of contaminants concentrations among shell samples were smaller than soft tissue samples; (ii) secondary pollution is less likely to affect shell samples during sampling and transportation; and (iii) the shells was hypothesized to "record" past exposure to contaminants according to their annual growth ring.

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