Electronic Supplementary Information (ESI)

Online solid sampling platform using multi-wall carbon nanotube assisted matrix solid phase dispersion for mercury speciation in fish by HPLC-ICP-MS

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1. Off-line Matrix Solid-Phase Dispersion Procedure

The initial extraction of mercury species from fish samples was performed by an off-line MSPD system that consisted of 3-mL plastic syringes and 3-mL polypropylene frits (Derian Instrument CO., Shanghai, China). This off-line MSPD system was operated on commercial solid phase extraction equipment that was equipped with a vacuum manifold processing station (Agilent Technologies, Santa Clara). The whole off-line MSPD procedure and equipment setup are briefly described as following: 10 mg of fish samples and 4 mg MWCNTs were accurately weighed into an agate mortar and then blended for around 5 min using an agate pestle to obtain a homogeneous mixture. This mixture was quantitatively transferred to a 3 mL of syringe wherein 0.2 g C18 protected between two polyethylene frits was put on the bottom. Finally a third polyethylene frit was placed at the top of the syringe and slightly compressed with a syringe plunger. The MSPD was operated on a commercial equipment of solid phase extraction. Mercury species were eluted from the syringes by the vacuum manifold processing station with 2 mL eluent. The extracts were diluted 10 times and analyzed by HPLC-ICP-MS.

2. Microwave-Assisted Acid Digestion of Fish Sample

In order to evaluate the extraction efficiencies of mercury species by MSPD, microwave assisted acid digestion was also used to completely digest the fish samples prior to analysis of ICP-MS. The digestion was carried out according to the following steps: triplicate 200 mg of CRMs, grouper or puffer fish samples were weighed into70-mL precleaned Teflon vessels wherein 5 mL concentrated HNO_3 and 1 mL 30% H_2O_2 were added. Three sample blanks were also processed along with the fish samples. Subsequently Teflon vessels were capped tightly and heated in a microwave oven (Master 40, Shanghai Sineo Microwave Chemistry Technology CO., China) operated under the following acid digestion procedures: ramping temperature from room temperature to 80 ^{o}C at 800 W for 4 min; from 80 to120 ^{o}C at 800 W for 3 min; from 120 to 160 ^{o}C at 800 W for 10 min. After cooling, the caps were removed and the digests were transferred to precleaned glass volumetric flasks and diluted to 50

mL with Milli-Q water prior to analysis.

3. Investigation of precision by using the proposed method

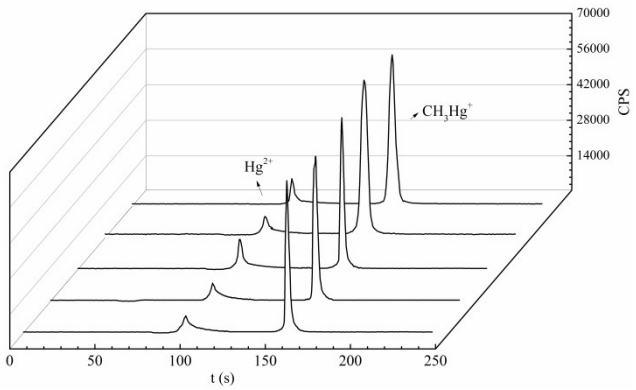

Fig. S1 The precision (relative standard deviation, RSD) of replicate speication analysis of DORM-2. Experimental conditions: 1 mg of DORM-2; 2 mg of MWCNTs; elution solution, 2% (v/v) HCl and 1.5% (m/v) L-cysteine.