Fig. S1. Effect of the HCOOH concentration on the Hg absorbance.

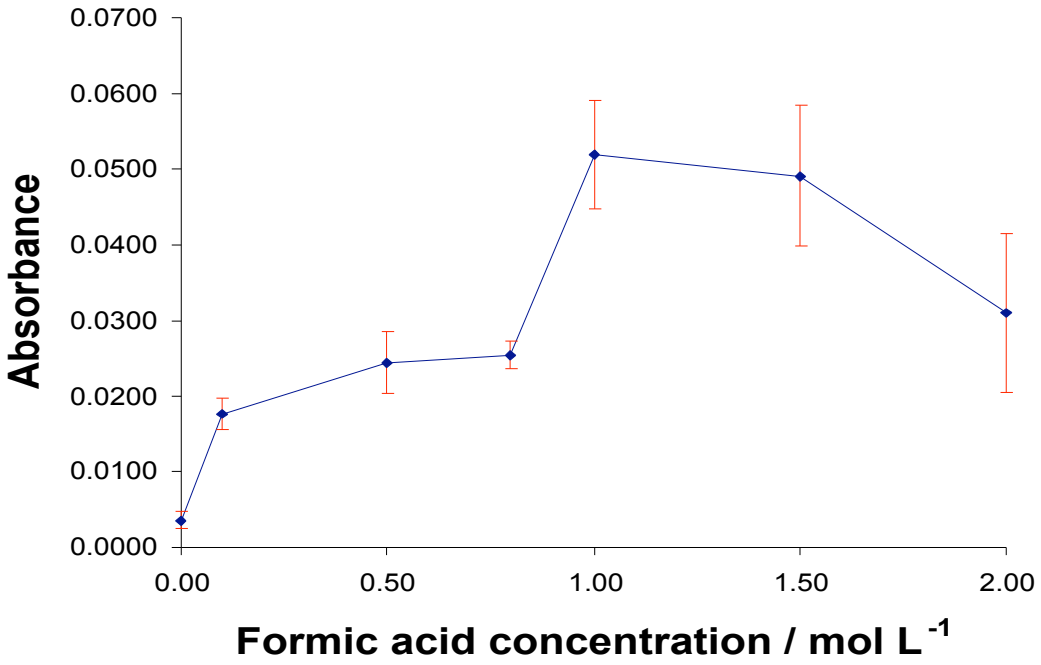

Fig. S2. Effect of the ultraviolet irradiation time on the Hg absorbance.

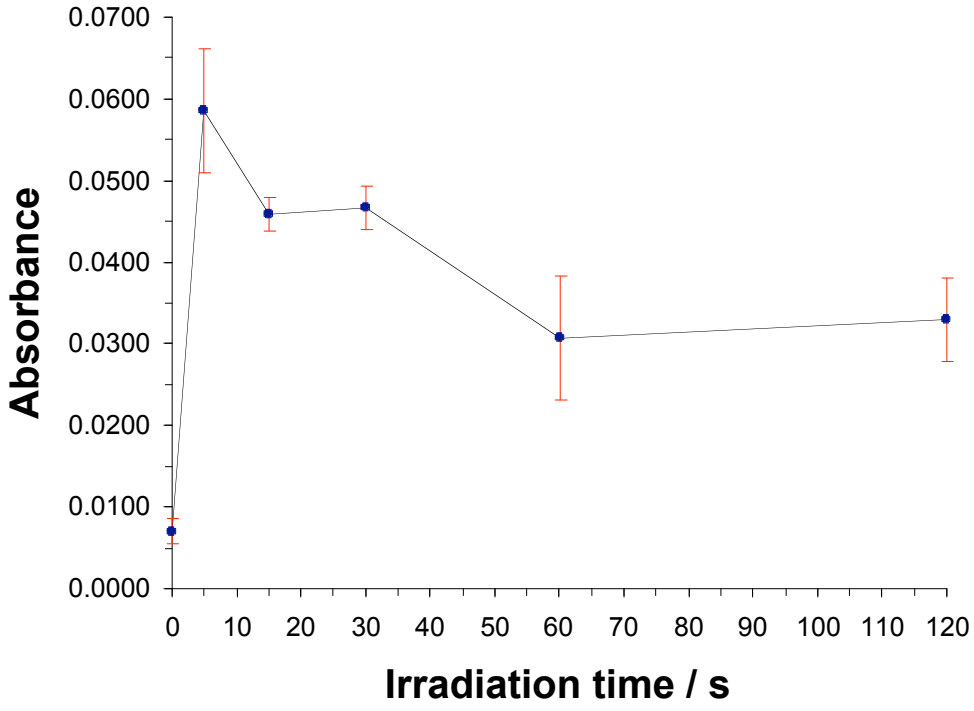

Fig. S3. Effect of the ultrasound irradiation time on the Hg absorbance.

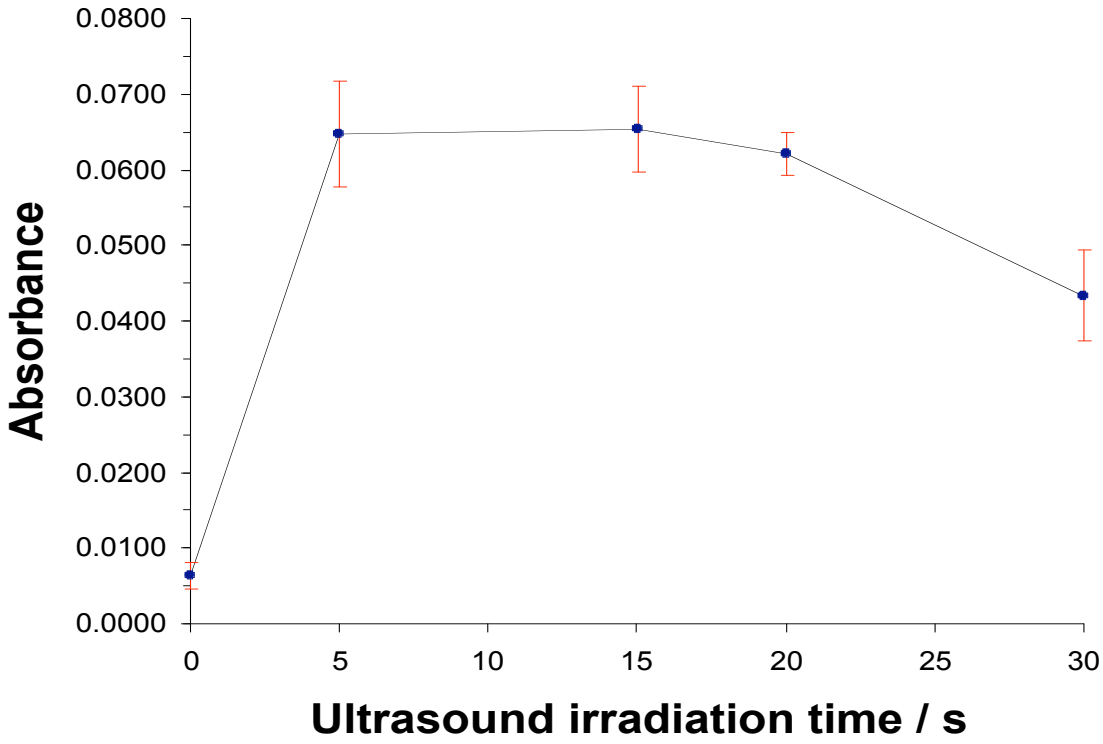

Fig. S4. Effect of the Ar flow-rate on the Hg absorbance.

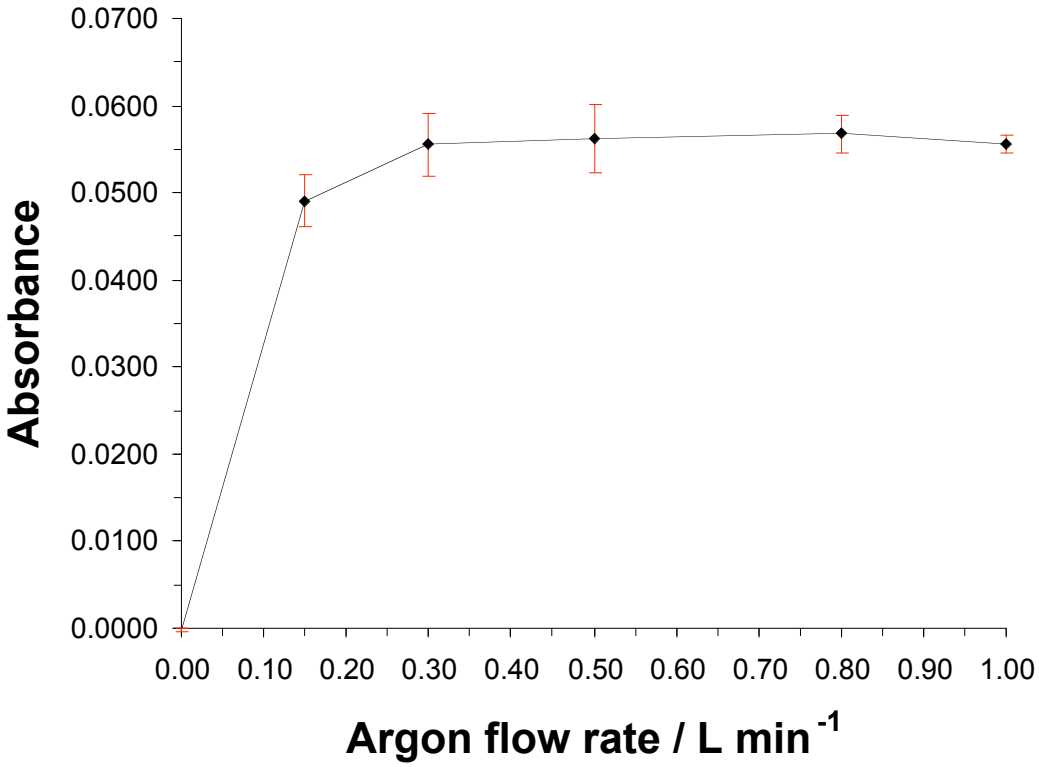

Table S5. Interference effects for Hg(II) in the application of the photo-induced vapour generation with ultrasound-assisted gas-liquid separation (UV+US) or only ultrasound-induced vapour generation (US).

Interference	Interference Concentration (mg/L)	Interference Effect (%) (US+UV)	Interference Effect (%) (US)
Humic acid	1	-23	-45
$CaCl_2$	100	+3	-54
$CoCl_2$	10	-4	-21
$CrCl_3$	10	-18	-18
$CuCl_2$	10	0	-50
$CuCl_2$	1	-2	-24
KCl	100	-3	-50
KNO_3	100	-19	+1
$MgCl_2$	100	-6	-60
$MnCl_2$	10	-4	-37
Na_2CO_3	100	-9	-50
NaCl	100	0	-34
$NiCl_2$	10	0	-18
$Pb(NO_3)_2$	10	+2	-6

Table S6. Recovery study for spiked extracts of CRM BCR 464 tuna fish.

Sample concentration[a] ($\mu g\ L^{-1}$)	Spiked Hg(II) concentration ($\mu g\ L^{-1}$)	Spiked CH_3Hg^+ concentration[b] ($\mu g\ L^{-1}$)	Total Hg found[c] ($\mu g\ L^{-1}$)	Average Recovery (%)
8	5	0	12.8 ± 0.3	96
8	0	5	12.7 ± 0.4	94
8	5	5	18.7 ± 1.0	107
8	10	5	23.2 ± 1.2	101
8	5	10	15.6 ± 1.4	104

[a] 636 mg of BCR CRM 464 tuna fish were extracted with 40 mL of 2.4 M HCOOH. 1 mL of extract was diluted to 10 mL with deionized water in a calibrated flask. 1 mL of the diluted sample was subjected to UV+US irradiation for Hg vapor generation.

[b] ($\mu g\ L^{-1}$) as Hg

[c] Average value ± standard deviation (N=3)