Electronic Supplementary Information (ESI)

Mercury Determination in Bioresorbable Calcium Phosphate Using a New Electrothermal Vaporization System Coupled to ICP-MS

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Table S-1. Operating parameters for Hg determination in bioresorbable calcium phosphate-based materials using the ICP-MS equipment in standard mode (pneumatic nebulization) or the ETV system coupled to ICP-MS equipment.

Parameter	**ETV-ICP-MS**	**NEB-ICP-MS**
RF power, W	1300	1300
Plasma gas flow rate,L min^{-1}	15.0	15.0
Auxiliary gas flow rate, L min^{-1}	2.0	2.0
Nebulizer/carrier gas flow, L min^{-1}	1.10	1.14
Dwell time, ms	20	20
Sweeps per reading	1	5
Readings per replicate	1300	5
Replicates	1	3
Isotopes, m/z	^{202}Hg	

Table S-2. Heating program used for the determination of Hg in bioresorbable calcium phosphate-based materials by ETV-ICP-MS.

Step	**Temperature, °C**	**Ramp time, s**	**Hold time, s**
Drying*	80	0	30
Pyrolysis	300	1	20
Vaporization	650	1	10
Cooling	100	0	120

* This step was performed without the closed glass chamber and when an aqueous solution was used for calibration.

Figure S-1. Schematic representation of the bioresorbable calcium phosphate-based materials analysis procedure using the ETV system. (A) Piece of paper used for weighing and transferring the sample to the ETV system; (B) Sample weighing; (C) Sample transfer to the lamp holder; and (D) Insertion of the lamp with the sample in the vaporization chamber.

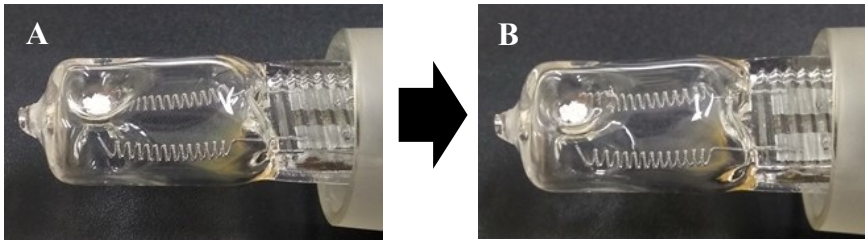

Figure S-2. Lamp containing Sample-1 (A) before and (B) after been submitted to the heating program. Conditions: 3 mg of Sample-1, vaporization at 650 ºC (hold time of 10 s) and carrier gas flow rate of 1.09 L min^{-1}.

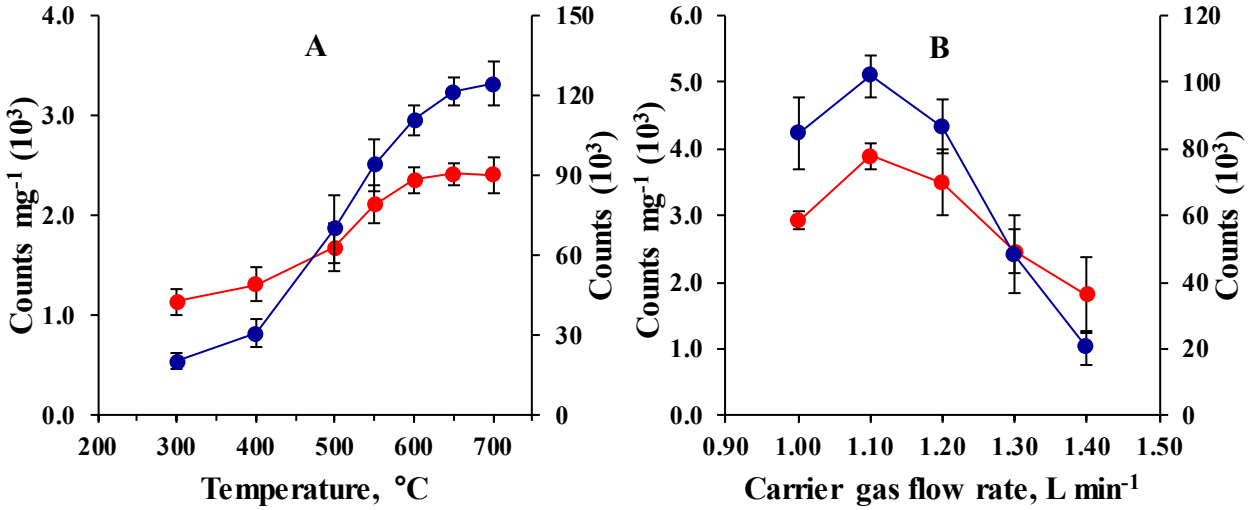

Figure S-3. (A) Vaporization curves of Hg by ETV-ICP-MS. Conditions: vaporization step (hold time of 10 s) and carrier gas flow of 1.10 L min^{-1}. (B) Effect of carrier gas flow rate on Hg signal intensity. Conditions: vaporization at 650 ºC (hold time of 10 s). (●) Signal intensity normalized to 1.0 mg (3 to 4 mg of Sample-1) corresponding to the vertical axis on the left side. (●) Signal intensity for 250 pg of Hg from 2 µL of aqueous reference solution corresponding to the vertical axis on the right side.

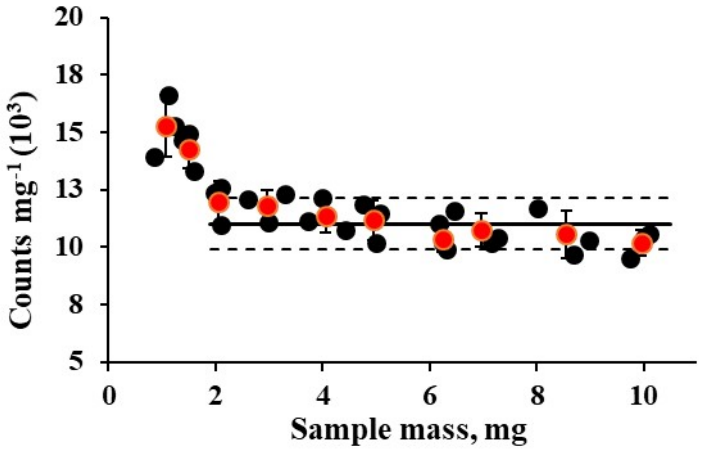

Figure S-4. Effect of sample mass on Hg signal intensity by ETV-ICP-MS. (●) Individual result of Hg intensity for each sample mass. (●) Results of the mean Hg intensity for each sample mass range. (—) The result of the mean Hg intensity was obtained from the suitable mass range for the analysis. Conditions: Sample-1, vaporization at 650 ºC (hold time of 10 s) and carrier gas flow rate of 1.10 L min^{-1}.

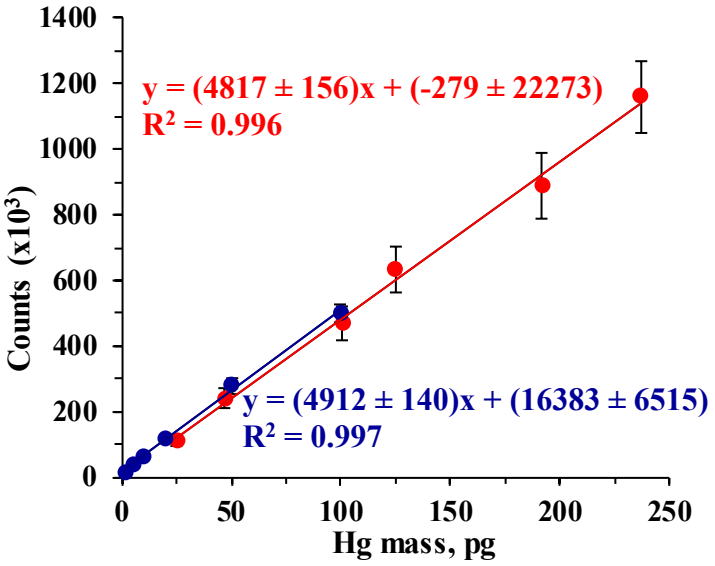

Figure S-5. Calibration strategies from (●) CRM MESS-3 and (●) aqueous reference solution added to the sample residue for Hg determination in bioresorbable calcium phosphate-based materials by ETV-ICP-MS. Regression equation: y = (slope ± standard error) x + (intercept ±

standard error). Conditions: vaporization at 650 ºC (hold time of 10 s) and carrier gas flow rate of 1.10 L min^{-1}.