Supporting Information

Electrochemical Generation of Palladium Volatile Species Enhanced with Sn(II): Application for Detection of Pd(II) by Pyrolytic Graphite-Coated Furnace Atomic Absorption Spectrometry

Alireza Shams[a], Narges Ashraf[*,a], Mohammad Hossein Arbab-Zavar[a], Mahboobeh Masrournia[b]

[a] *Department of Chemistry, Faculty of Science, Ferdowsi University of Mashhad, Mashhad, Iran*

[b] *Department of Chemistry, Mashhad Branch, Islamic Azad University, Mashhad, Iran*

** Corresponding author: ashraf-n@um.ac.ir*

Table S-1: Graphite furnace temperature program applied for modification of graphite tube.

Step	Start temp. (ºC)	End temp. (ºC)	Ramp time (s)	Hold time (s)	Ar flow rate (mL/min)
Drying	80	140	10	5	200
Ashing	400	700	10	5	200
Atomization	1400	1400	0	5	0
Cooling	0	0	0	10	200

Fig. S-1†

EDX profile of PdVS trapped on a carbon/formvar coated copper grid during the ECVG system, (Pd(II): 5 mgL^{-1}, with Sn(II) (5mg L^{-1}) in Cell). All the conditions for ECVG system were set at the optimum values.

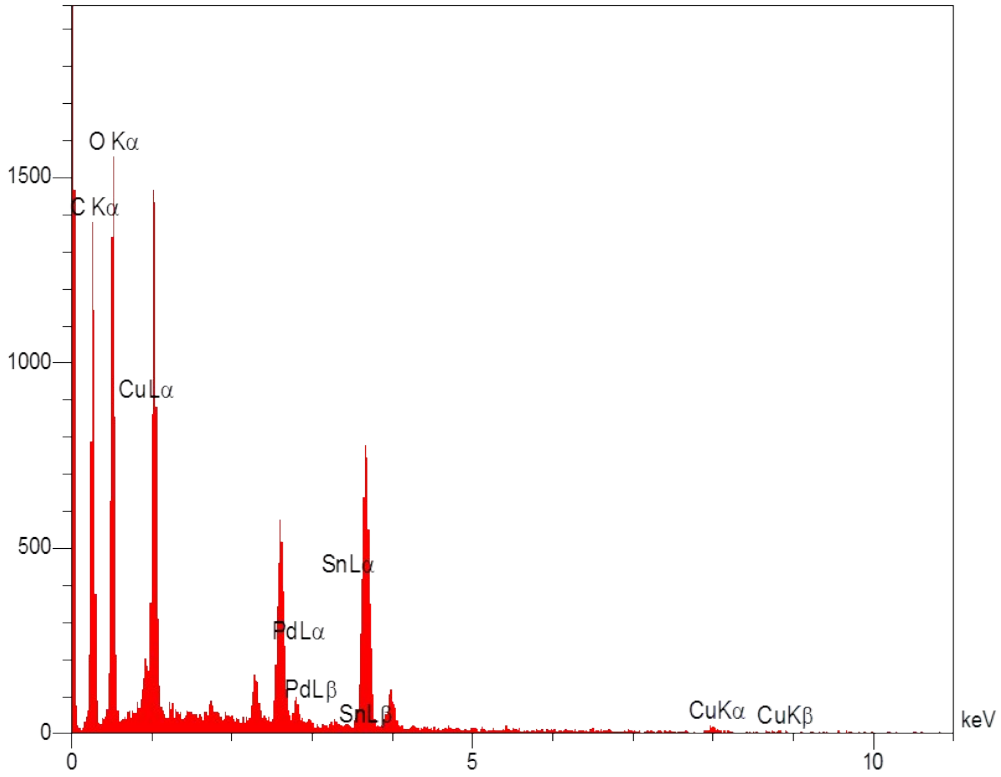


Fig. S-2†

The absorbance vs. time plots. The ECVG cell was coupled to the quartz tube atomizer (in the absence of the flame). Pd(II): 5 mgL^{-1} and all the conditions for ECVG system were set at the optimum values.

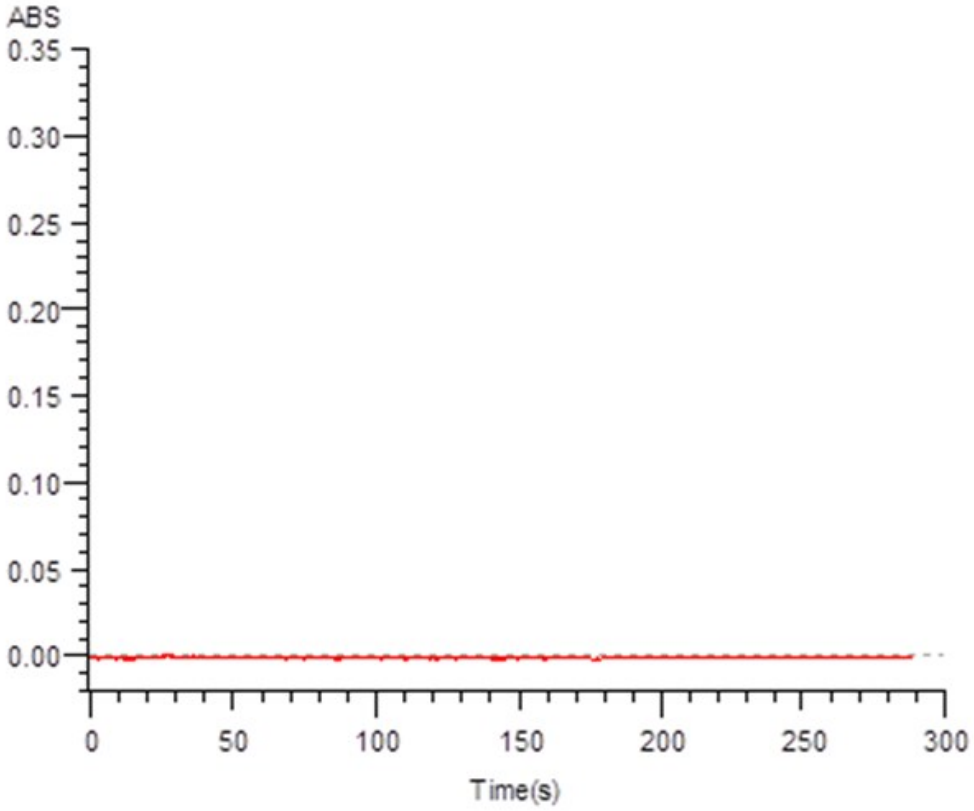


Fig. S-3†

Effects of different modifiers on the absorbance peak height of palladium. (Pd(II): 500 ng L^{-1}: Trapping temperature: 400°C, Catholyte: 0.005 mol L^{-1}). All other conditions for ECVG-GFAAS were set at the optimum values.

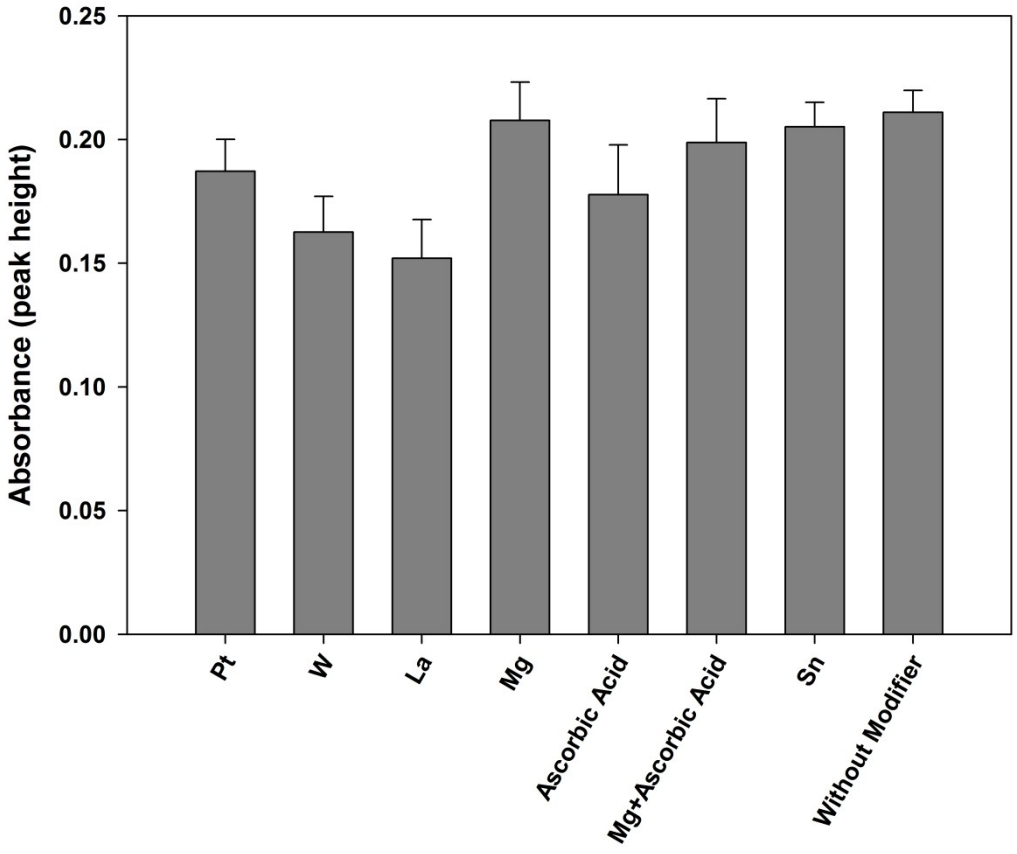
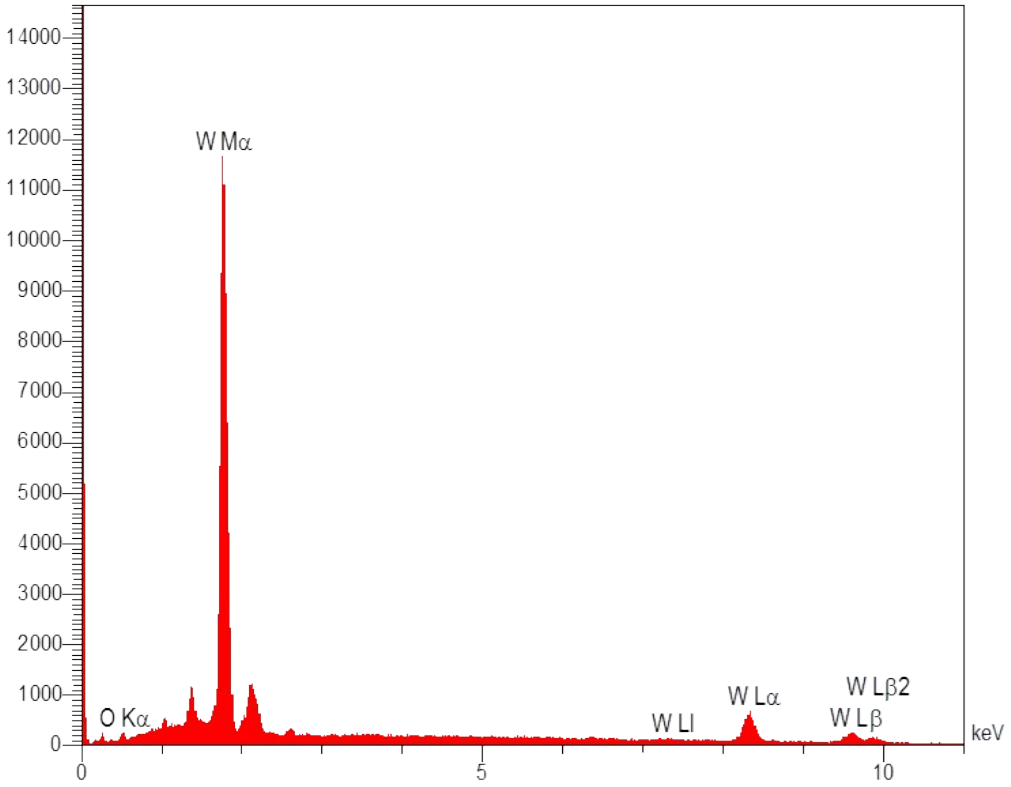


Fig. S-4†

EDX profile (surface of W-TIG welding electrode)



Elt	Line	Int	Error	K	Kr	W%	A%	Class
O	Ka	10.4	43.6722	0.0150	0.0138	5.97	42.18	A
W	La	141.4	2.7283	0.9850	0.9086	94.03	57.82	A
				1.0000	0.9224	100.00	100.00	

Fig. S-5†

Effects of different catholyte solutions on the absorbance peak height of palladium. (Pd(II): 500 ng L^{-1}: Trapping temperature: 400°C, Catholyte: 0.005 mol L^{-1}). All other conditions for ECVG-GFAAS were set at the optimum values.

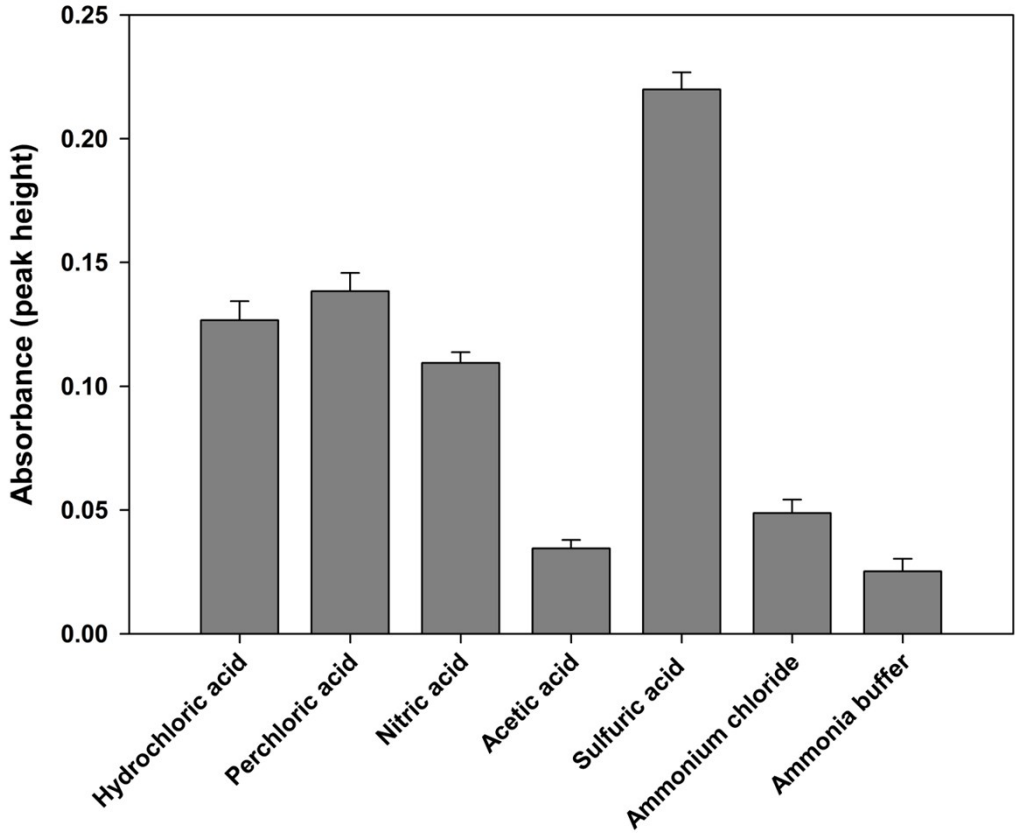


Fig. S-6†

Effect of the presence of Sn(II) (5 mg L^{-1}, as enhancement reagent) in the ECVG cell (Pd(II): 50 ng L^{-1}). All the conditions for ECVG-GFAAS were set at the optimum values.

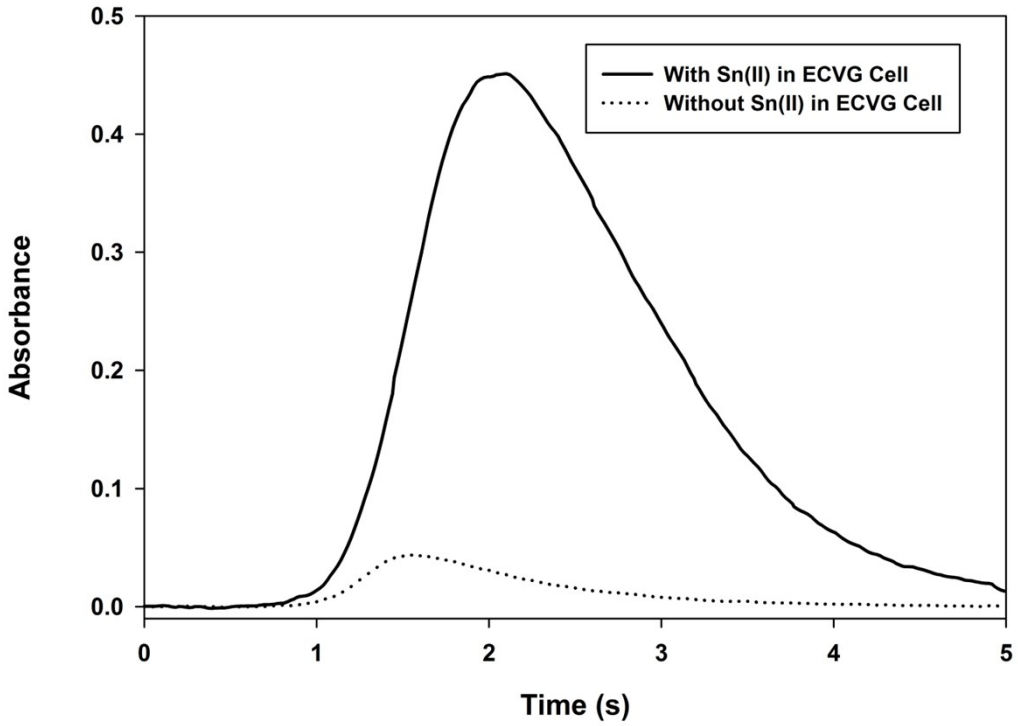


Fig. S-7†

The absorbance vs. time plots obtained by applying Pb HCL, Sn HCL. (Blank solution). All the conditions for ECVG-GFAAS were set at the optimum values.

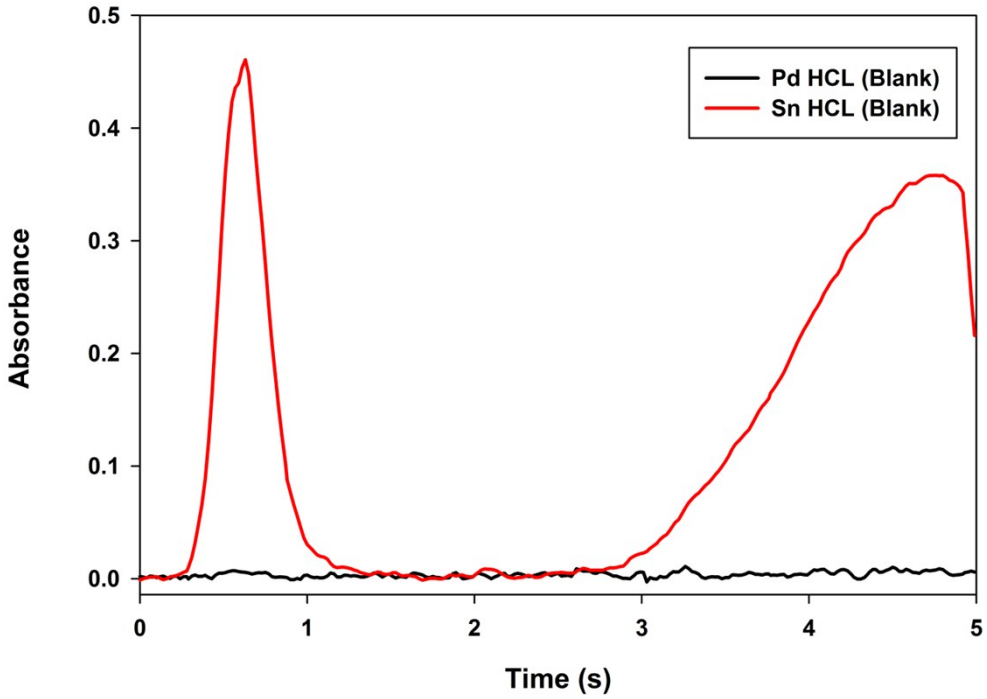


Fig. S-8†

Dependence of the absorbance signal vs. time during ECVG-FAAS (Pd(II): 50 mg L^{-1}); All the conditions for ECVG were set at the optimum values.

a) With Sn(II) (5 mg L^{-1}) in the ECVG cell

b) Without Sn(II) in the ECVG Cell

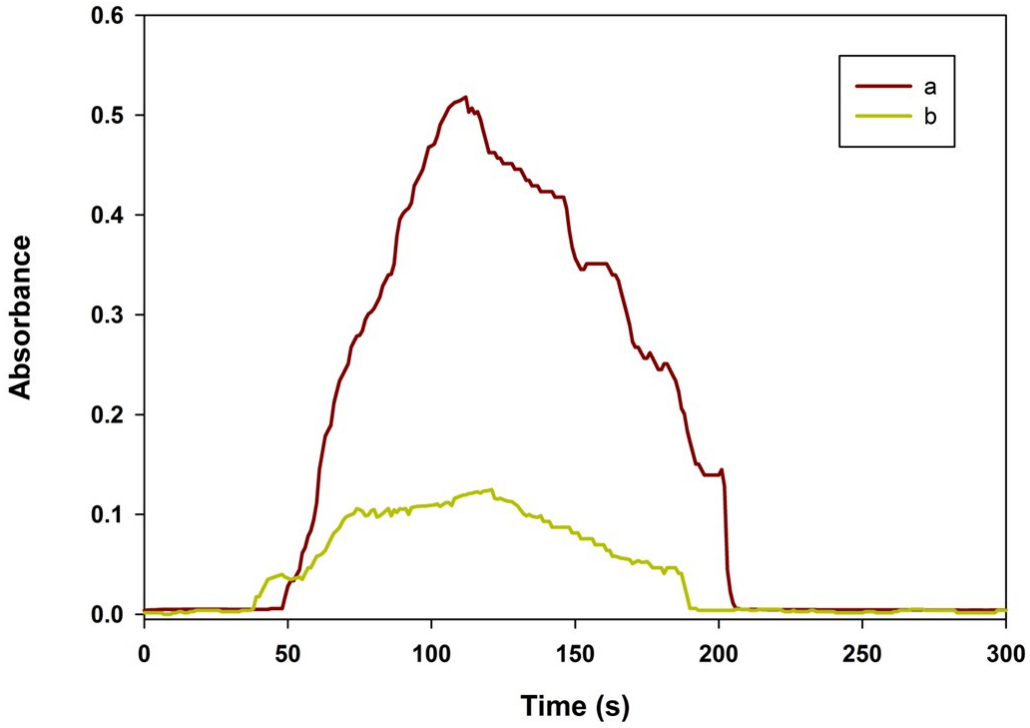


Fig. S-9†

The statistical evaluation of the obtained results using the Pareto chart with a minimum t-value of 3.18 at a confidence level of 95.0%. Concentration of Pd(II) 500 ng L^{-1}.

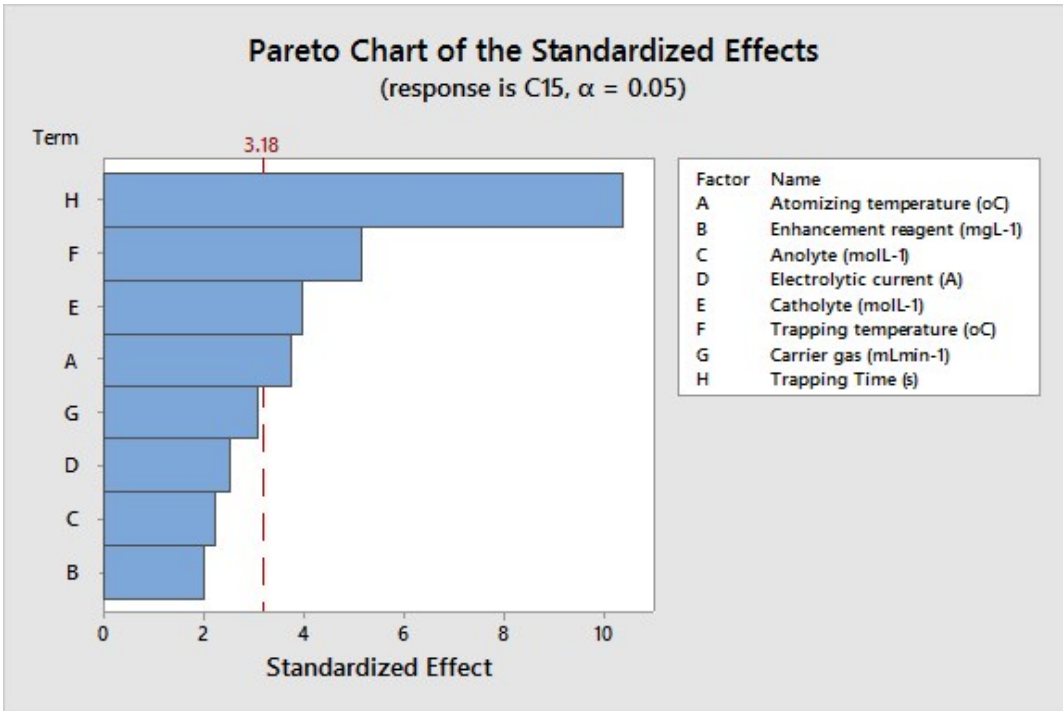


Fig. S-10†

Effects of different atomization temperatures on the absorbance peak height of palladium. (Pd(II): 50 ng L^{-1}), Catholyte: 0.005 mol L^{-1} sulfuric acid. All other conditions for ECVG-GFAAS were set at the optimum values.

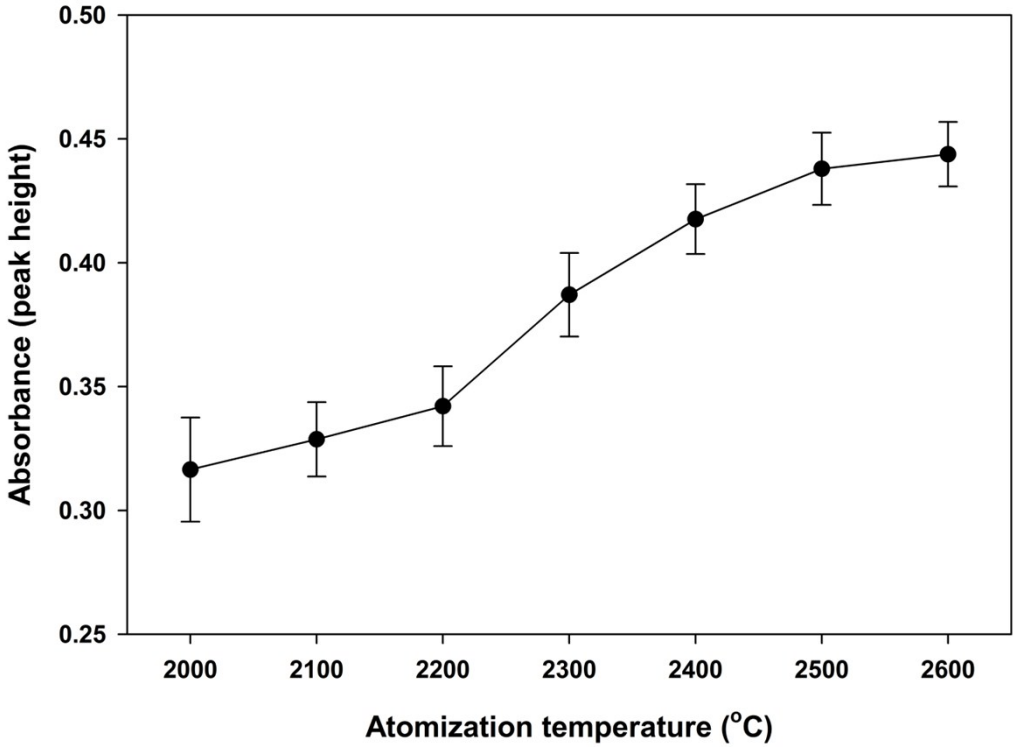


Fig. S-11†

Effects of different catholyte concentrations on the absorbance peak height of palladium (Pd(II): 50 ng L^{-1}). All other conditions for ECVG-GFAAS were set at the optimum values.