Supplementary Material

Determination of bioavailable lead in atmospheric aerosol using unmodified screen-printed carbon electrodes

Habdias de A. Silva-Neto[†], Thiago M. G. Cardoso[†], Wendell K. T. Coltro[†], Roberta C. Urban[‡*]

[†] Instituto de Química, Universidade Federal de Goiás, Goiânia, GO, 74690-900, Brazil.

[‡] Environmental Biogeochemistry Laboratory (LBGqA), Department of Chemistry, Federal University of São Carlos, São Carlos, SP, 13565-905, Brazil.

Corresponding author:
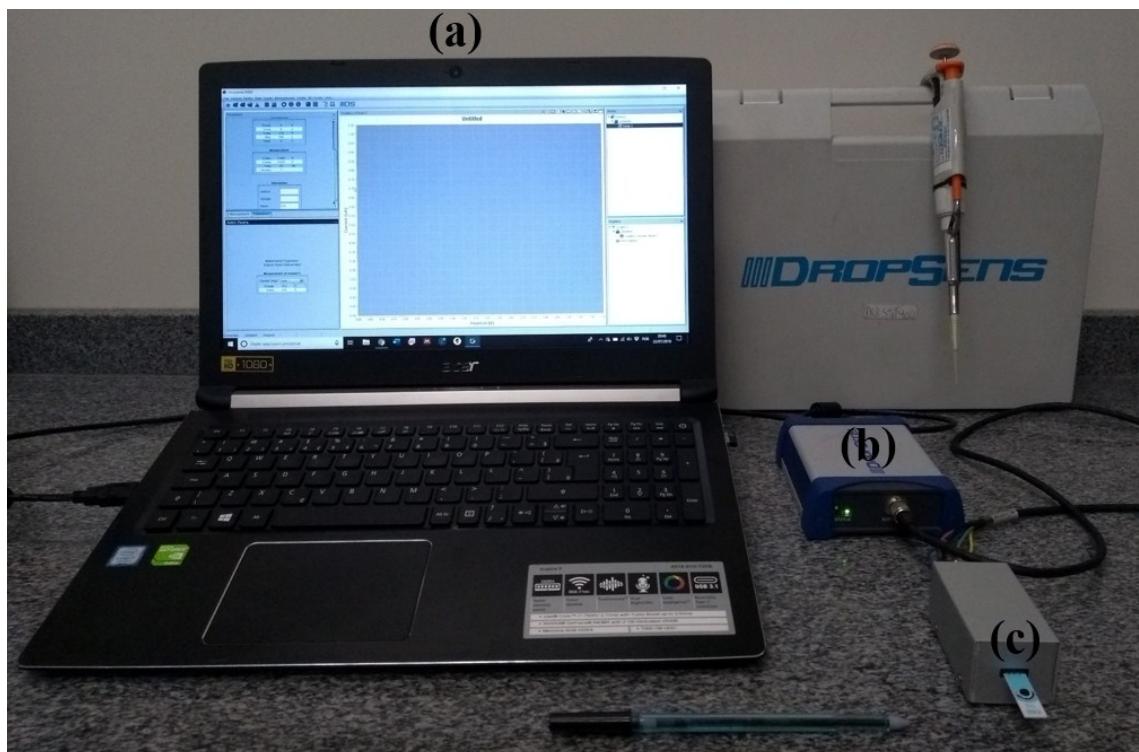
*roberta.urban@ufscar.br

Figure S1. Electrochemical detection system: (A) notebook with software DropView®; (B) portable bipotentiostat/galvanostat model µStat 400; (C) the screen-printed carbon electrode containing the sample.

Table S1 Meteorological variables during the 2016 year in the Goiania city.

Month	Temperature (ºC)	Relative humidity (%)	Pluviometric precipitation (mm)	Wind speed (km h^{-1})
March	26 ± 1	73 ± 6	132.5	2 ± 1
April	25 ± 2	63 ± 5	0.0	2 ± 1
May	24 ± 1	63 ± 4	5.0	1 ± 1
June	21 ± 2	61 ± 5	0.0	2 ± 1
July	21 ± 1	56 ± 3	0.0	2 ± 1
August	23 ± 2	53 ± 6	26.2	2 ± 1
September	26 ± 1	51 ± 5	16.6	2 ± 1
October	26 ± 2	62 ± 8	217.8	2 ± 2
November	25 ± 2	74 ± 6	164.3	2 ± 1
December	25 ± 1	70 ± 7	159.4	2 ± 1

Table S2 Comparison between different carbon-based sensors for the detection of Pb (II).

Sensor and electrochemical method	Deposition		Linear range (µg L^{-1})	LOD (µg L^{-1})	Reference
	Potential (V)	Time (s)			
SPCE – SWASV	-1.2	120	100 - 300	39	1
SPBiE – SWASV	-1.0	180	20 - 150	6.1	2
SPCE – DPASV	-1.5	120	17.5 - 101	5.3	3
Sb/SPCE - DPASV	-0.7	120	16 - 56	4.8	4
Bi/SPCNTE - SWASV	-1.5	240	5.0 - 150	1.0	5
AgNP/Bi/Nafion/SPCE – SWASV	-1.6	300	0.1 - 500	0.1	6
Nafion/Bi/NMC/GCE – DPASV	-1.2	150	0.5 - 100	0.05	7
PANI NT/GCE	-1.1	300	0.05 - 50	0.04	8
Bi/P/SPCE - SWASV	-1.2	300	0.05 - 30	0.03	9
Bi/AuNP/SPCE - DPASV	-1.3	135	1.0 - 150	0.02	10
Porous-g-C_3N_4/O-MWCNTs/SPE	-1.3	240	0.35 - 6.5	0.008	11
SPCE – SWASV	-0.7	500	0.05 - 1.5	0.02	**This study**

Table S3. Lead concentrations determined using unmodified SPCE and inductively coupled plasma mass spectrometry (ICP-MS).

sample	Pb (µg m^{-3})

	SPCE (n = 3)	ICP-MS (n = 3)
March	0.045 ± 0.017	0.044 ± 0.004
August	0.101 ± 0.040	0.078 ± 0.002

References

1 A. S. Afonso, C. V. Uliana, D. H. Martucci and R. C. Faria, *Talanta*, 2016, **146**, 381–387.

2 M. R. Palomo-Marín, F. Rueda-Holgado, J. Marín-Expósito and E. Pinilla-Gil, *Talanta*, 2017, **175**, 313–317.

3 Pérez-Ràfols, C.; Serrano, N.; Díaz-Cruz, J. M.; Ariño, C.; Esteban, M. *Anal. Chim. Acta,* 2016, **916**, 17–23.

4 V. Sosa, C. Barceló, N. Serrano, C. Ariño, J. M. Díaz-Cruz and M. Esteban, *Anal. Chim. Acta*, 2015, **855**, 34–40.

5 P. Rattanarat, W. Dungchai, D. Cate, J. Volckens, O. Chailapakul and C. S. Henry, *Anal. Chem.*, 2014, **86**, 3555–3562.

6 J. Mettakoonpitak, J. Mehaffy, J. Volckens and C. S. Henry, *Electroanalysis*, 2017, **29**, 880–889.

7 L. Xiao, H. Xu, S. Zhou, T. Song, H. Wang, S. Li, W. Gan and Q. Yuan, *Electrochim. Acta*, 2014, **143**, 143–151.

8 Zhu, G.; Ge, y.; Dai, Y.; Shang, X.; Yang, J.; Liu, J. *Eletrochimica Acta,* 2018, **268**, 202–210.

9 Chen, C.; Niu, X.; Chai, Y.; Zhao, H.; Lan, M. *Sensors Actuators, B Chem.*, 2013, **178**, 339–342.

10 Lu, Z.; Zhang, J.; Dai, W.; Lin, X.; Ye, J.; Ye, J. *Microchim. Acta* 2017, **184**, 4731–4740.

11 Ramalingam, M.; Ponnusamy, V. K.; Sangilimuthu, S. N. *Microchim. Acta*, 2019, **186**, 69.