Supplementary information

Local Electrochemical Sample Acidification for the Detection of Pb^{2+} Traces

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Stability of pseudo reference electrode potential *vs* different pH levels

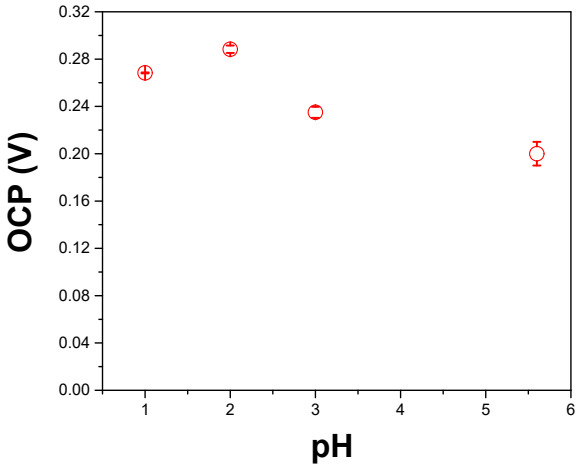

Fig S1. *Open Circuit Potential (OCP) measurements of the pseudo reference electrode at various pH (1; 2; 3 and 5.6)*

pH determination using gold oxide reduction potential

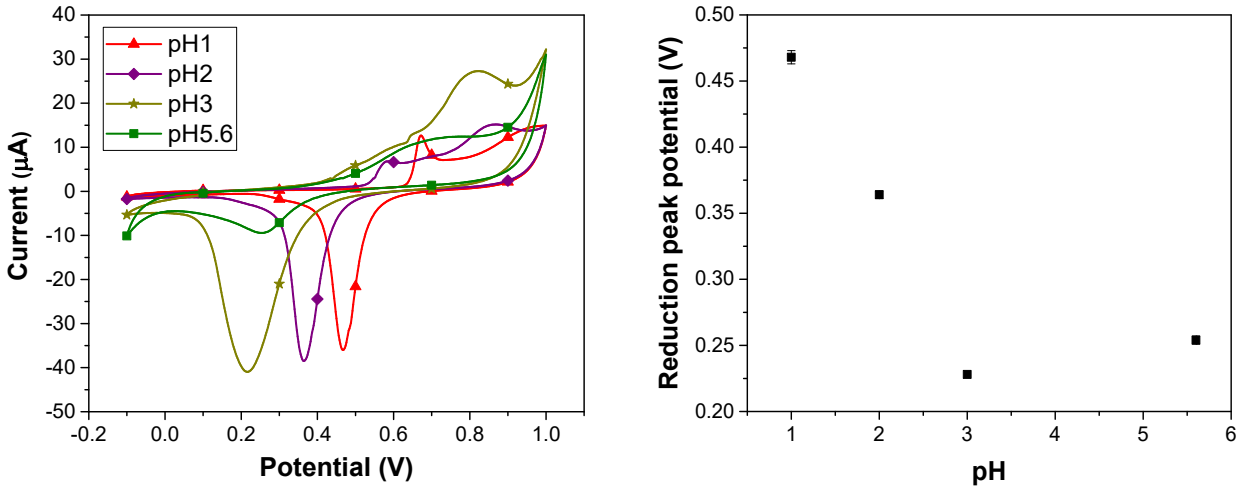

Fig S2. (A) *Cyclic voltammogram of the gold electrode obtained at different pH (0.1 M HNO_3 (pH 1), 0.01 M HNO_3+0.1M $NaNO_3$ (pH 2), 0.001 M HNO_3+0.1M $NaNO_3$ (pH 3), 0.1 M $NaNO_3$ (pH 5.6)). Scan rate 50 mV s^{-1}.* ***(B)*** *Influence of pH on the peak for the reduction f gold oxide.*

Influence of time on the acidification process

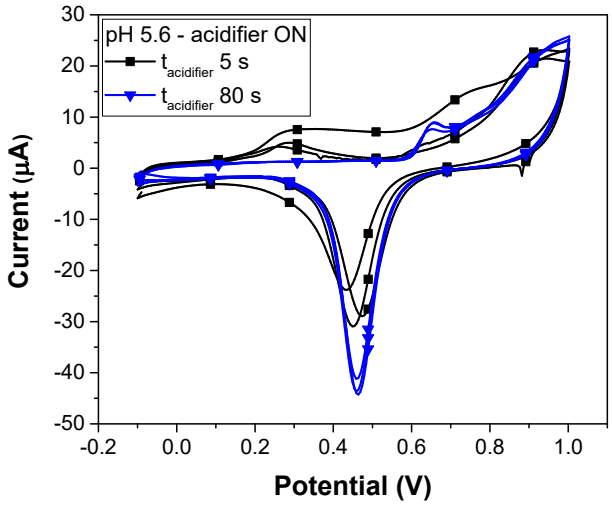

Fig S3. *Cyclic voltammogram of the gold electrode obtained in 0.1 M $NaNO_3$ (pH 5.6) solution, after applying the optimized acidified potential ($E_{acidifier}$ of 1.2 V) in different time ($t_{acidifier}$ of 5 s and 80 s). N = 3 for each $t_{acidifier}$ condition. Scan rate 50 mV s^{-1}*

Effects of pH on lead detection

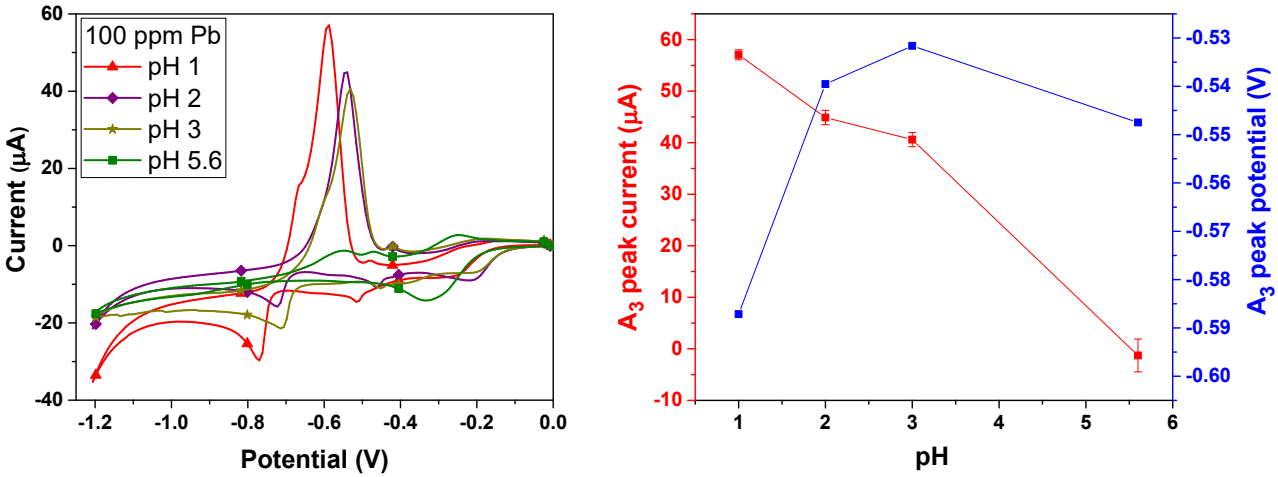

Fig S4. *(A) Cyclic voltammograms obtained for a lead concentration of 100 ppm in different pHs (0.1 M HNO_3 (pH 1), 0.01 M HNO_3+0.1 M $NaNO_3$ (pH 2), 0.001 M HNO_3 + 0.1 M $NaNO_3$ (pH 3), 0.1 M $NaNO_3$ (pH 5.6)). Scan rate 50 mV/s. (B) Influence of pH on the A_3 peak anodic stripping of lead.*

Repetitions of SWVs for 100 ppb Pb^{2+} without regeneration step

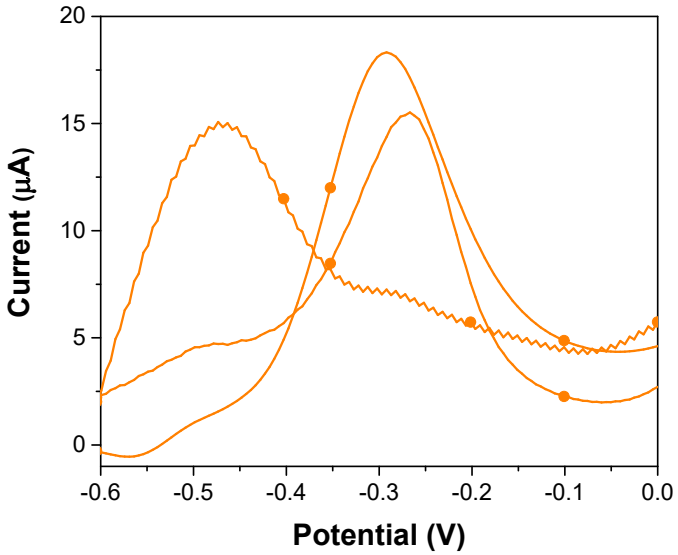

Fig S5. *Three consecutive SWVs of 100 ppb Pb^{2+} tested three time in the same conditions (0.1 M $NaNO_3$ (pH 5.6) with the acidifier switch on, without regeneration step.*

Cyclic voltammetry of Pt in 0.1 M $NaNO_3$

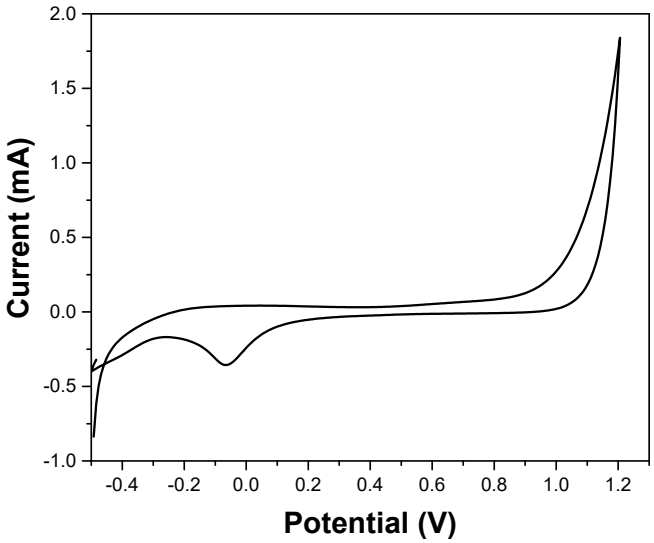

Fig S6. *Cyclic voltammogram on the platinum grid obtained in 0.1 M $NaNO_3$ solution. Scan rate 100 mV s^{-1}*

Impact of copper interference in anodic stripping voltammetry

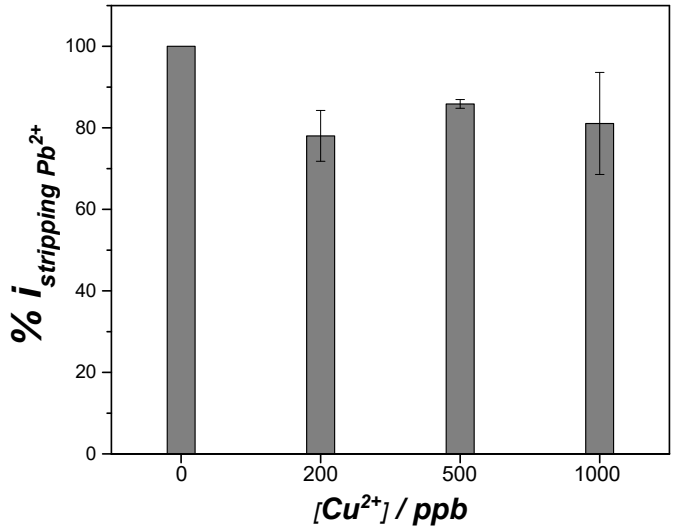

Fig S7. *Effect of Cu^{2+} concentration on the stripping current percentage of Pb^{2+}: result obtained by SWV of 100 ppb Pb^{2+} in the absence and in the presence of 200; 500 and 1000 ppb of Cu^{2+} (N = 3) tested 0.1 M $NaNO_3$ (pH 5.6) with the acidifier switch on*