Electronic Supplementary Material (ESI) for Analyst.
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Electronic supplementary information for

Direct arsenic(III) sensing by a renewable gold plated Ir-based microelectrode

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The peak potential in Arve river and phosphate are different at the same pH (Δ = +0.15 V between phosphate and the river sample) . We suppose that this shift is coming from the matrix effect. On Fig. S7, the voltammograms were superposed in order to improve the comprehension.

The second peak on Fig. S7 comes from the copper naturally present in the sample. The unfiltered and the filtered Arve river sample were taken in two different days and this is explained why there is not the same peak in the unfiltered Arve river sample.

Figure Captions

Fig. S1. Cyclic voltammetry in HNO_3 (pH 2), 0.01 M $NaNO_3$ on an IrM at 50 mV/s, with initial and reversal potentials of -500 mV and +800 mV vs. Ag/AgCl, respectively. E_{dep} = -300 mV.

Fig. S2. Consecutive chronoamperograms (1-5) on an IrM with a gold deposition layer obtained before (a) and after (b) the application of ten consecutive pulses (+800 mV, 50 ms) to oxidize/desorb impurities at the Iridium microdisk substrate. E_{dep} = -300 mV; Solution: 0.1 M $NaNO_3$, HNO_3 pH 2.

Fig. S3. As(III) peak current at 50 nM As(III) obtained as a function of the indicated gold layer thickness. Sample and SWASV conditions as in Fig. 4.

Fig. S4. Lifetime comparison for consecutives replicates between a solid gold microelectrode (circle) and the Au-IrM (square) for a concentration of 25 nM and 50 nM As (III) respectively. Sample and SWASV conditions as in Fig. 4, except $t_{precleaning}$ = 2 min for the solid gold microelectrode.

Fig. S5. Two calibrations plot in presence of increasing concentration of As(III) (5, 10, 15, 20, 25, 30 nM) performed on a cleaned solid gold microelectrode in two different days. Sample and SWASV conditions as in Fig. 4, except $t_{precleaning}$ = 2 min.

Fig. S6. Calibration plots of stripping current as a function of increasing Cu(II) concentration (0, 10, 30, 60, 100 nM) in presence of 5 nM As(III) corresponding to Fig. 8. Sample and SWASV conditions as in Fig. 5.

Fig. S7. SWASV peak current obtained with the addition of 5 nM As(III) (t_{prec} = 36 min) (a) without (b) or with the presence of a 1.5% LGL agarose layer of 375 (±25) µm in unfiltered/filtered Arve river. The pH was fixed at 8 by a gas mix made of N_2 and CO_2 for the Arve river samples. SWASV conditions as in Fig. 5.

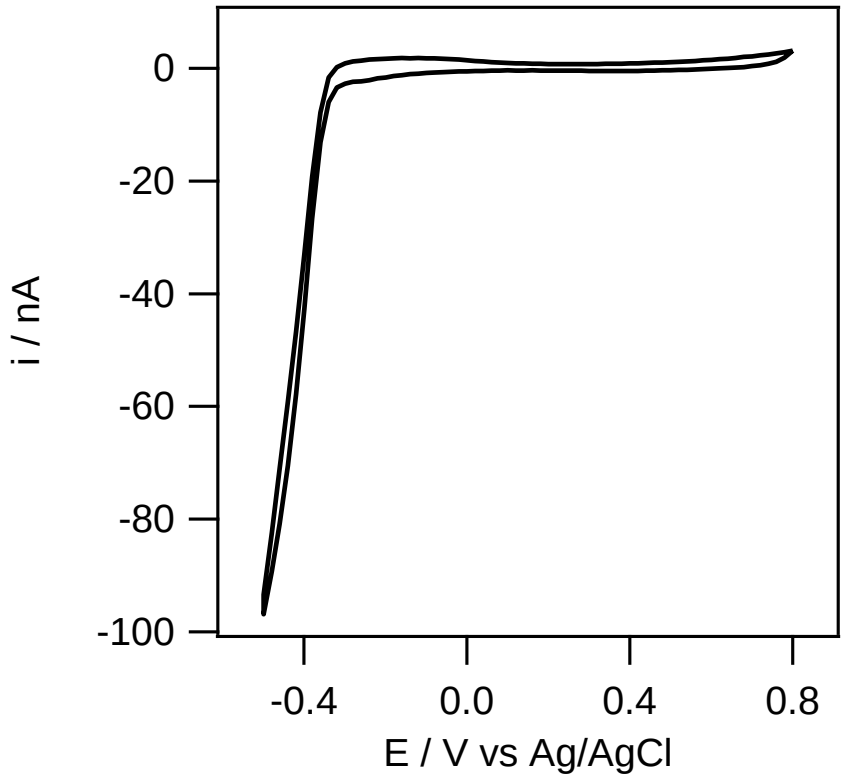
0
-20
-40
-60
-80
-100
i / nA
-0.4
0.0
0.4
0.8
E / V vs Ag/AgCl

Fig. S1

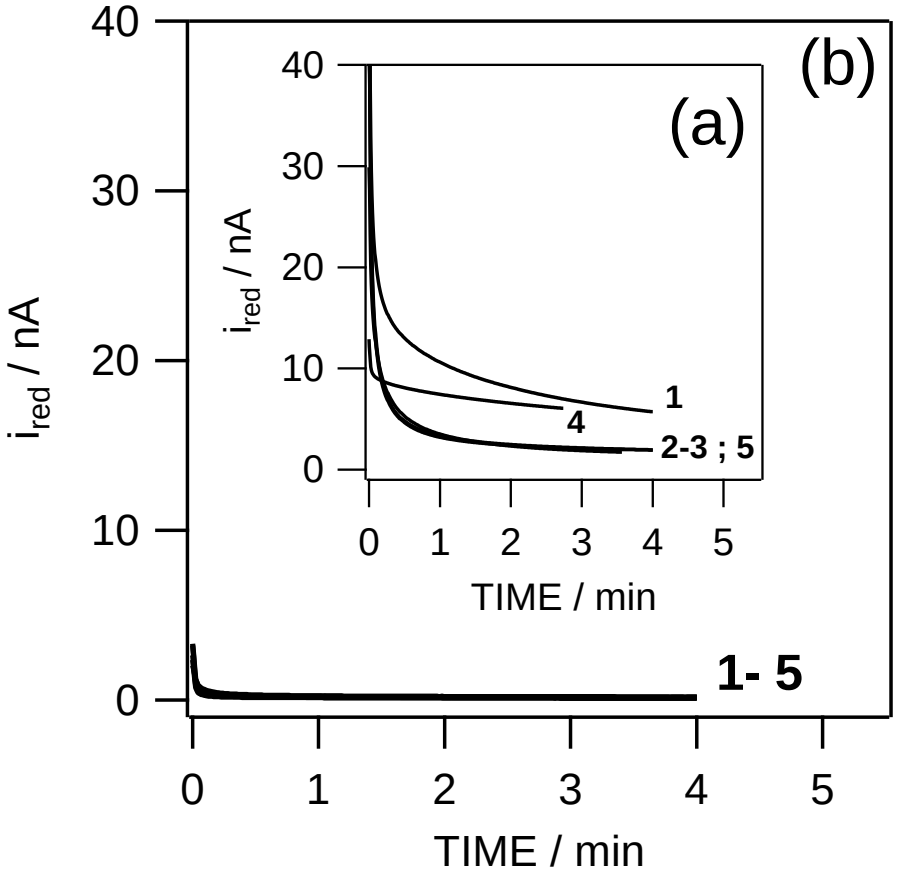
40
30
20
10
0
i_{red} / nA
(b)
1- 5
0
1
2
3
4
5
TIME / min
(a)
1
4
2-3 ; 5

Fig. S2

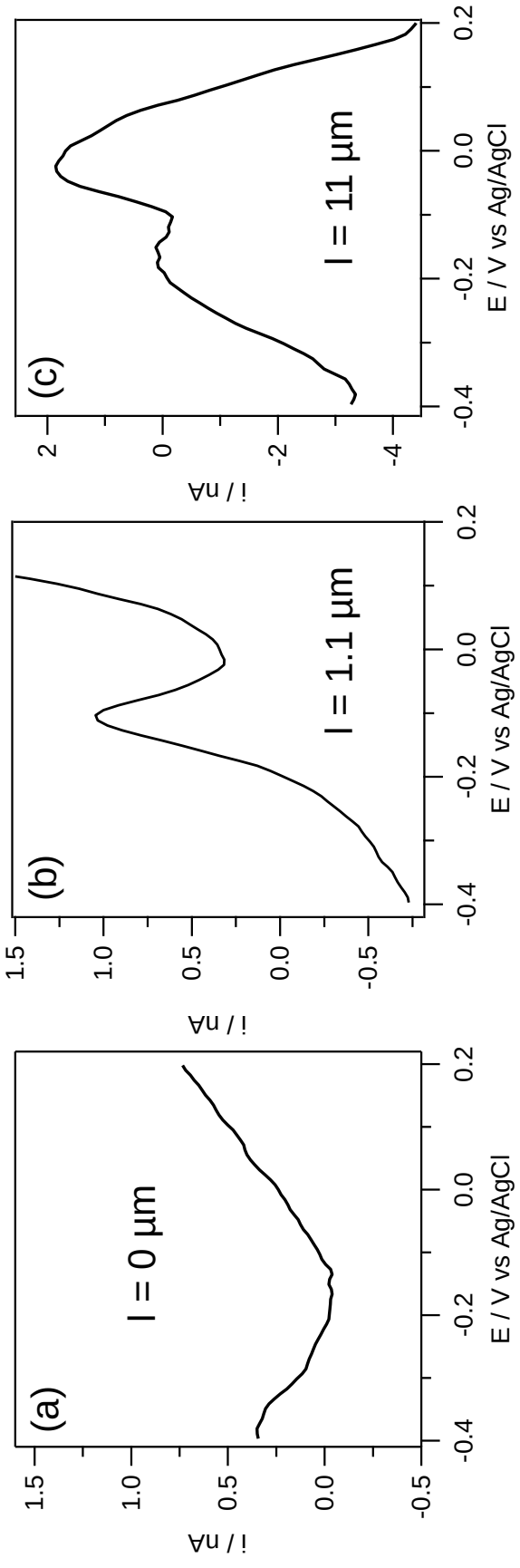

Fig. S3

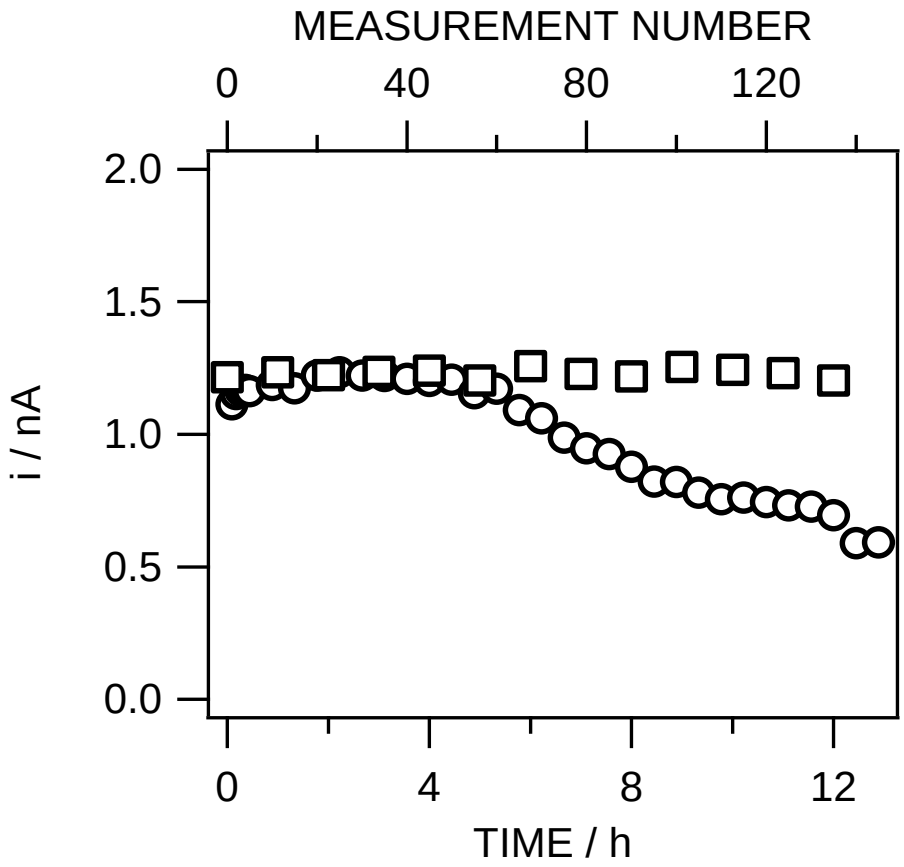
MEASUREMENT NUMBER
0
40
80
120
2.0
1.5
1.0
0.5
0.0
i / nA
0
4
8
12
TIME / h

Fig. S4

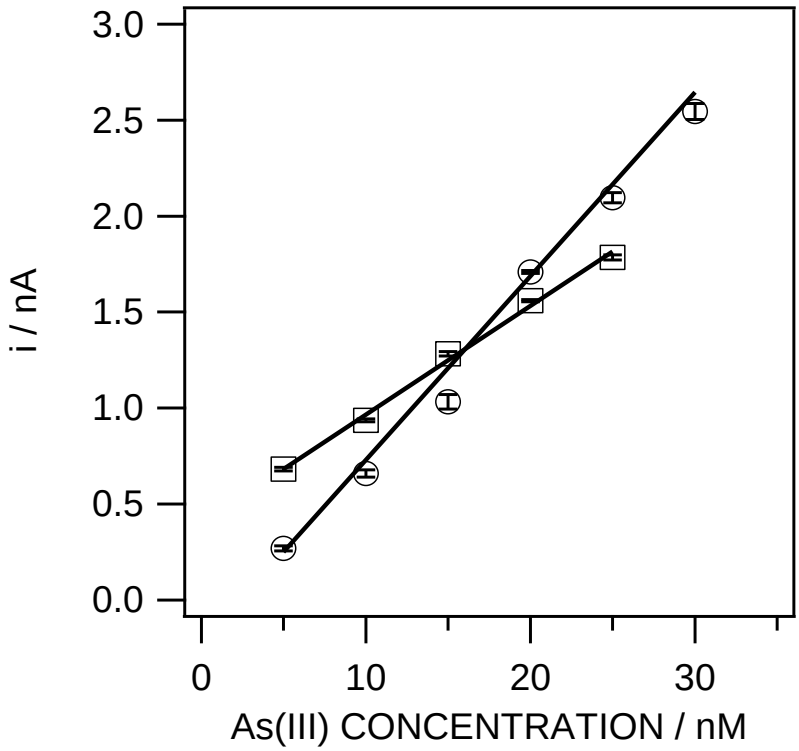
3.0
2.5
2.0
1.5
1.0
0.5
0.0
i / nA
0
10
20
30
As(III) CONCENTRATION / nM

Fig. S5

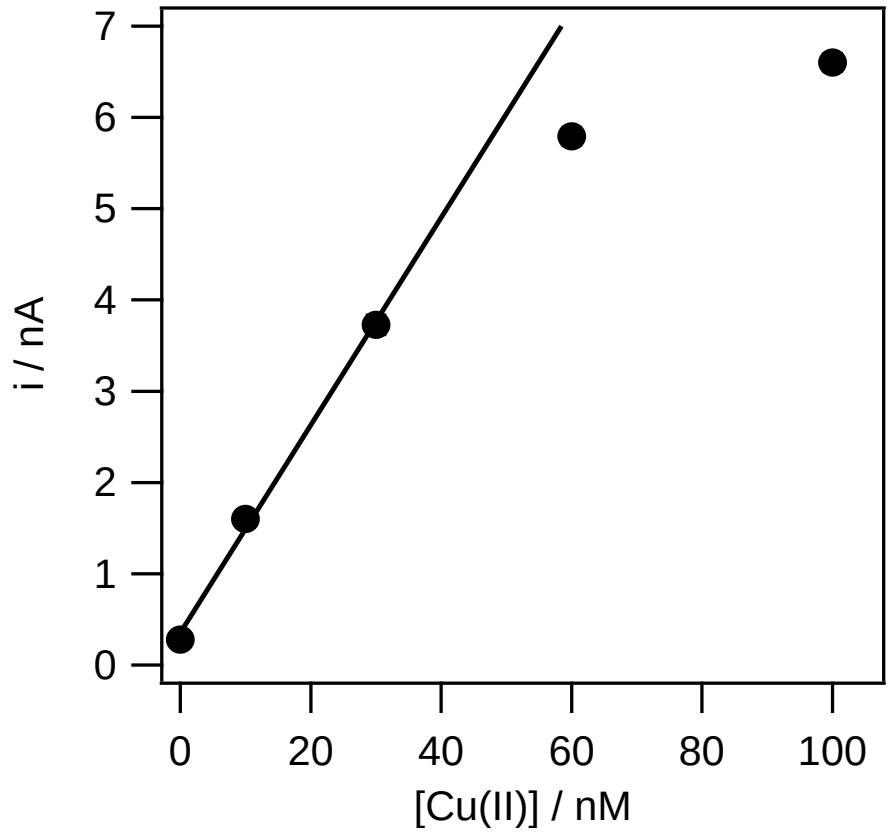

Fig. S6

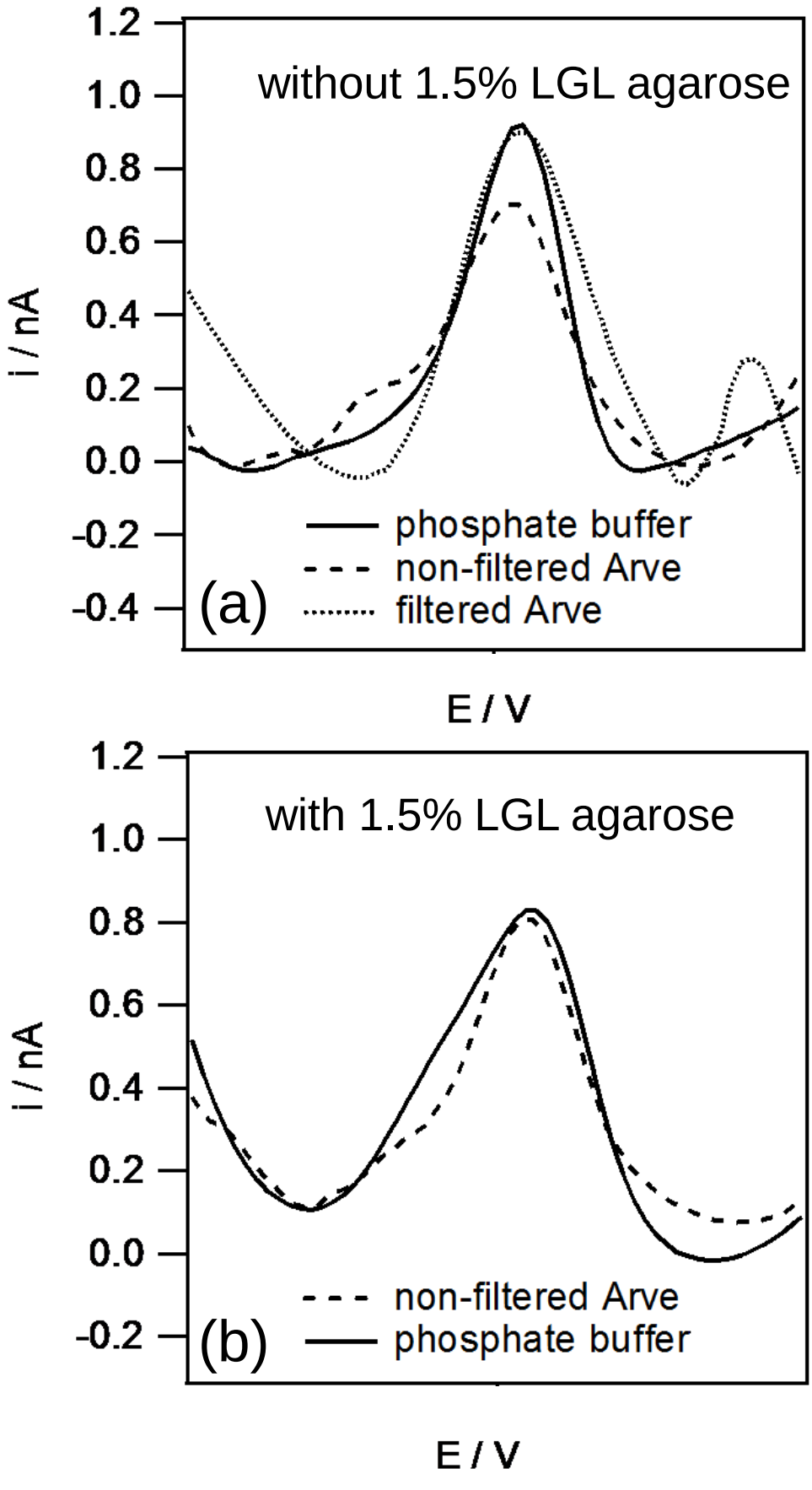
without 1.5% LGL agarose
phosphate buffer
non-filtered Arve
filtered Arve
(a)
i / nA
E / V
with 1.5% LGL agarose
non-filtered Arve
phosphate buffer
(b)
i / nA
E / V

Fig. S7