ItalSens Gold SPE IS-W1-3.C1.RS.35-M1

1 Description

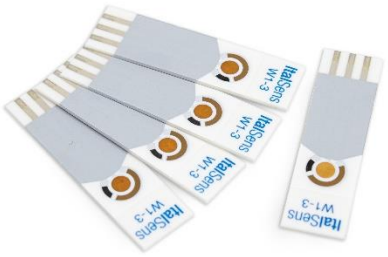

Figure 1 ItalSens IS-W1-3.C1.RS.35-M1 cut into single units

The three-electrode electrochemical cell has a gold working electrode, suitable for a wide range of analytical applications. Each electrode is produced by screen-printing technology and constitutes a circular gold working electrode (3 mm diameter), a silver pseudo reference electrode, and a gold counter electrode. The small electrode dimensions reduce the required sample volumes and the low costs permit disposable use.
The working electrode received an electrochemical treatment to enhance the surface, i.e. reducing the impedance across the interface.

The electrodes are delivered as strips of 25 pieces, which are already cut for you.

Samples can be applied as a droplet due to the design of the electrodes. This avoids the waste of reagents and samples. The electrodes can be modified through direct adsorption, chemical binding, etc., and a wide range of biomolecules can be linked to the electrode surface. These customizations make the gold electrodes suitable for a broad spectrum of applications.

1.1 Application Advice

The silver pseudo-reference electrode shows higher stability in the presence of chloride ions. Hence, it is recommended that measurements are carried out in solutions with a chloride ion concentration of at least 10 mM.
For these electrodes, electropolishing is optional but in case of further surface modification, e.g. self-assembled monolayers, a recently electropolished surface usually produces better results. Electropolishing can be easily performed by cyclic voltammetry. Put 100 µL of 0.5 M sulfuric acid on the three electrodes or immerse the three electrodes in 0.5 M sulfuric acid. 3 Scans from 0 to 1.4 V with a scan rate of 0.1 V/s should suffice.

2 Technical Specifications

Dimensions: 0.73 x 5.0 cm
Working electrode dimensions: 7.07 mm²
Thickness: 650 µm
Contact pad pitch: 2.54 mm
Coefficient of Variation (CV, After polishing) (n = 10): 2 %

3 Measurements

3.1 Electropolishing

All measurements were performed with a droplet of solution covering all three electrodes of the cell. The solution contained 0.5 M H_2SO_4.

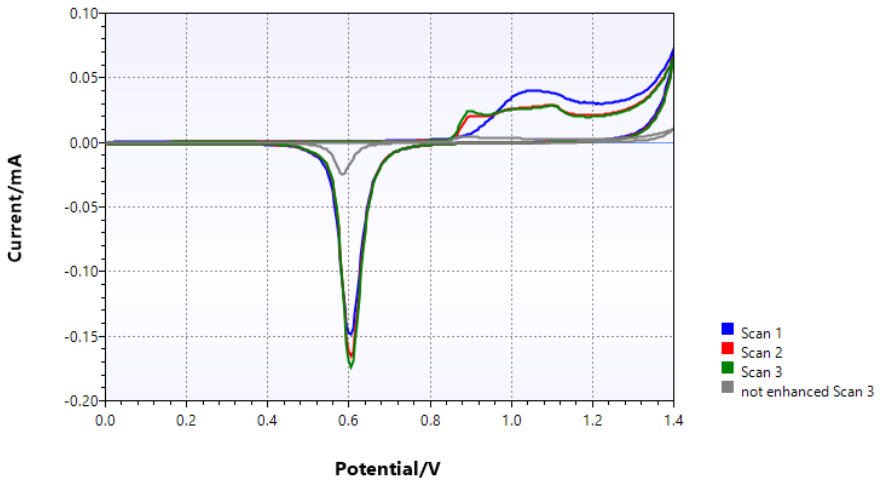

Figure 2 CV, IS-W1-3.C1.RS.35-M1, scan rate 0.1 V/s, E step 5 mV (not enhanced electrode in grey)

3.2 Cyclic Voltammogram

All measurements were performed with a droplet of solution covering all three electrodes of the cell. The solution contained 2.5 mM $K_3[Fe(CN)_6]$, 2.5 mM $K_4[Fe(CN)_6]$, and 0.1 M KCl.

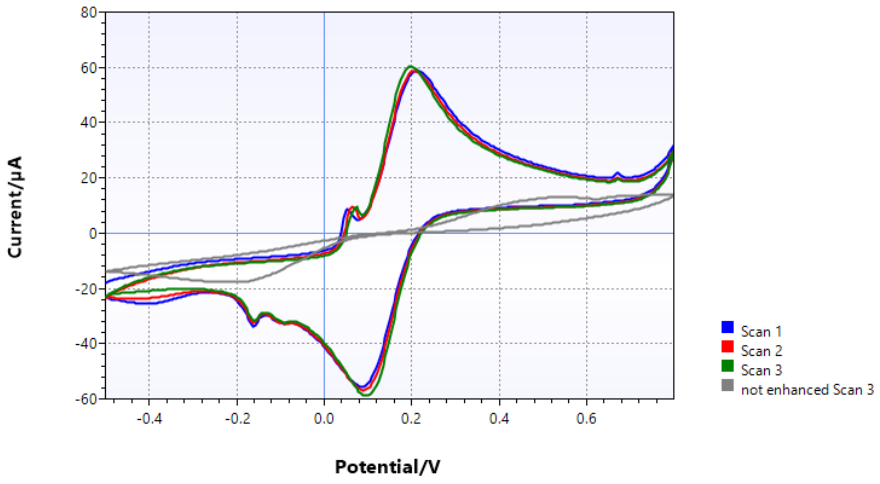

Figure 3 CV, IS-W1-3.C1.RS.35-M1, scan rate 0.1 V/s, E step 5 mV (not enhanced electrode in grey)

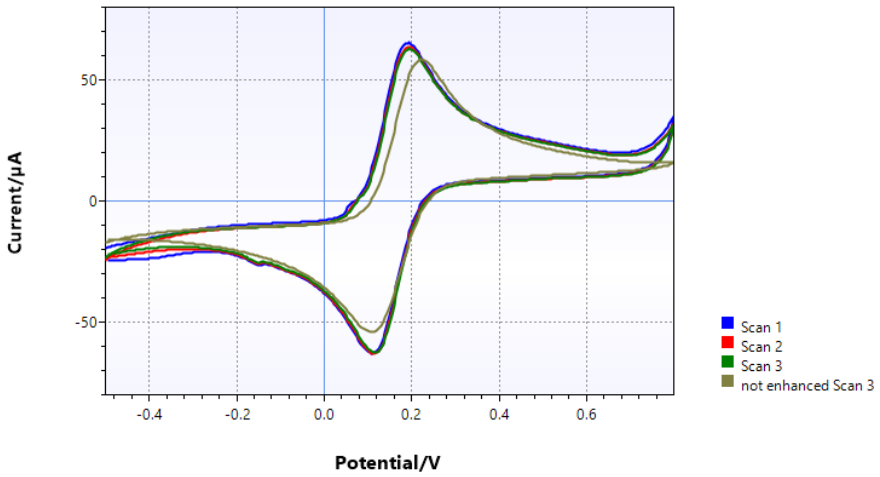

Figure 4 CV, electropolished IS-W1-3.C1.RS.35-M1, scan rate 0.1 V/s, E step 5 mV (not enhanced electrode in grey)

3.3 Electrochemical Impedance Spectroscopy

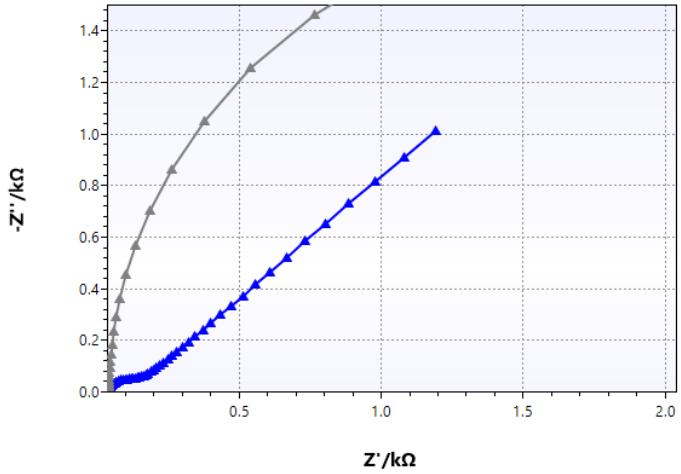

Figure 5 EIS, IS-W1-3.C1.RS.35-M1, E dc OCP, E ac 10 mV, frequency range 0.1 Hz to 1 MHz (not enhanced electrode in grey)

After electropolishing the IS-W1-3.C1.RS.35-M1 show usually lower impedance.

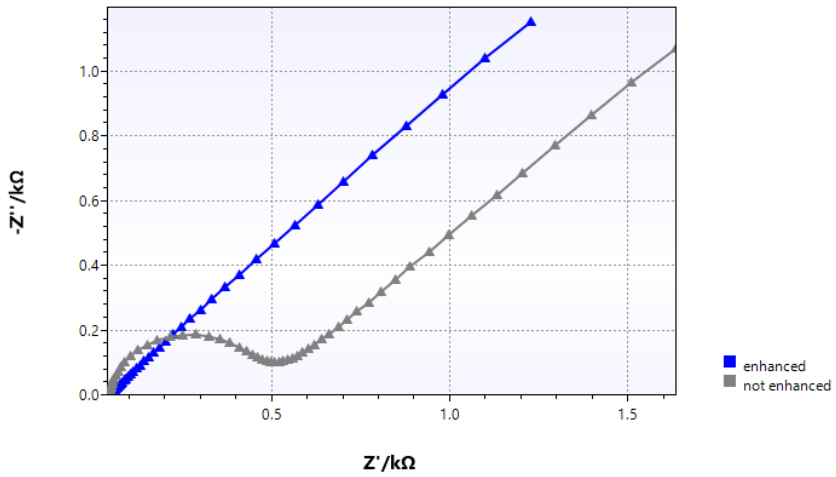

Figure 6 EIS, multiple polished IS-W1-3.C1.RS.35-M1, E dc OCP, E ac 10 mV, frequency range 0.1 Hz to 1 MHz (not enhanced electrode in grey)