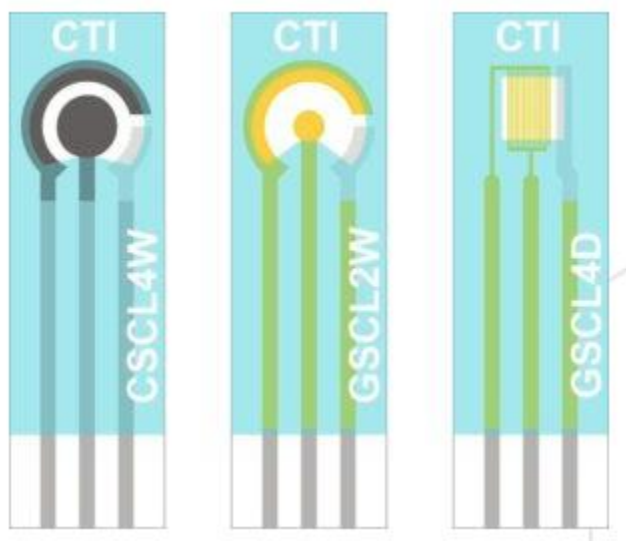


Phase Zero Sensors

1. Description



Phase Zero Sensors support early-stage development in the design of an assay for measurement of electrochemical signals between test fluids (bodily or otherwise) and a targeted analyte via potentiostat. These high-quality sensors are necessary tools for early stage development projects, enabling scientists and lab technicians to devise testing protocols for identifying electrochemical responses. They support iterative testing of reagent mixtures used in the detection of unique analytes within biological samples.

These sensors have a PET substrate, with carbon or gold (Au) working and counter electrodes, and a silver/silver chloride (Ag/AgCl) reference electrode along with a printed insulating dielectric. The mating trace leads are designed to interface with common potentiostat accessories as well as banana plugs or alligator clips. The well walls are designed to contain fluids allowing for reagent deposition to perform testing.

Plasma Treatment is an option that may increase precision for some Phase Zero Sensors. CTI plasma treats Phase Zero Sensors as individual test strips or in sheet form for 4 minutes in a plasma etching machine. MK II Plasma Desmear/Etchback and Surface Treatment System was used with PLASMAX program.

2. Dimensions and Specifications

Sensor Type	Working Electrode	Counter Electrode	Reference Electrode	SKU
Standard	Ø4mm Carbon Screen Printed	Carbon Screen Printed	Ag/AgCl Screen-printed	CSCL4W
Standard	Ø2mm Au (gold) Ablated	Au (gold) Ablated	Ag/AgCl Screen-printed	GSCL2W
IDE [InterDigitated Electrode]	Au (gold) Ablated	Au (gold) Ablated	Ag/AgCl Screen-printed	GSCL4D

Features

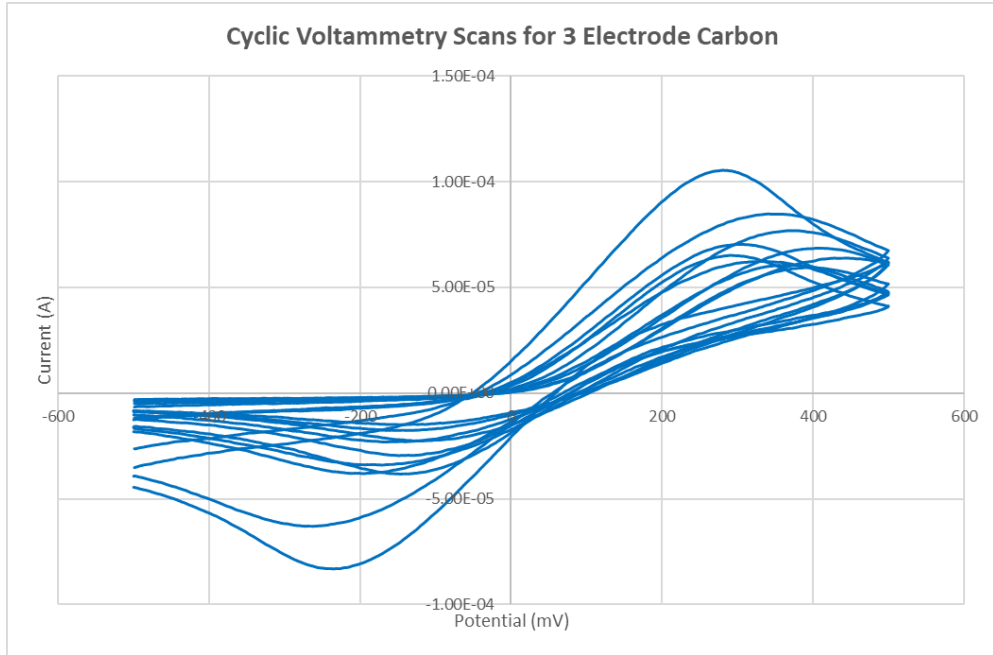
- Ablated and Screen Printed Electrodes.
- Overall Dimensions: 10mm x 33mm x 0.53 mm.
- Packed in vials of 25 sensors.
- Substrate: White PET Base Layer.
- Silver printed leads for robust connection.
- Compatible with common potentiostat's.
- Customization and scale up available.

3. Cyclic Voltammogram

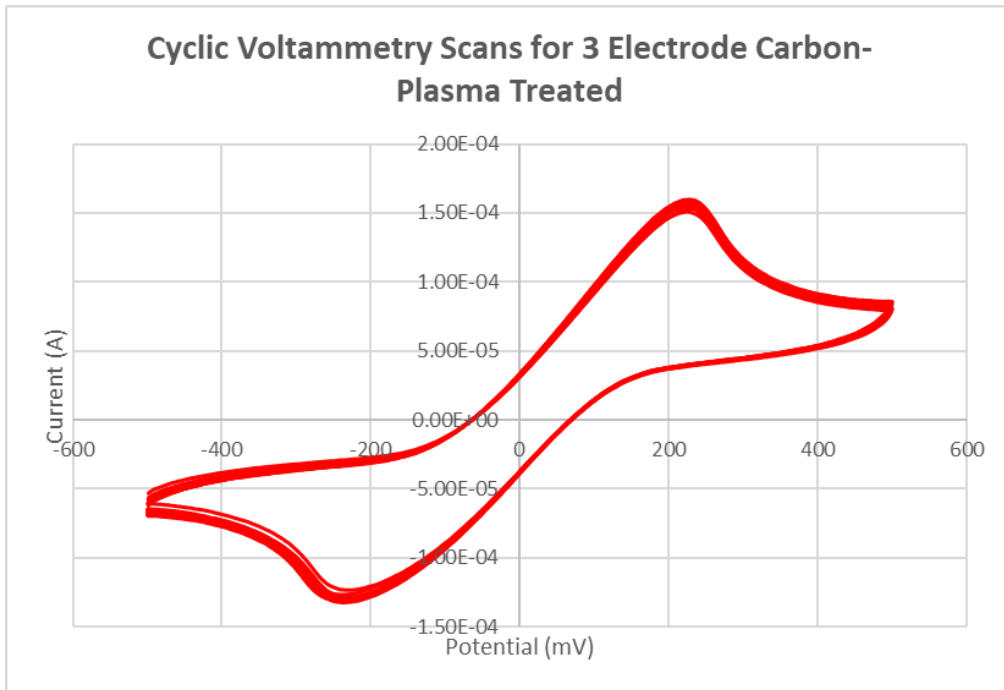
Testing results are in 3-electrode mode with a 200mM Kferricyanide / 5mM Kferrocyanide sample. The potentiostat leads were connected as follows: the working lead was connected to the sensor middle pin circular electrode. The counter lead was connected to the left sensor pin. The reference lead was connected to the right pin AgCl electrode on each sensor. The sample liquid droplet was placed on top of the electrodes and then the test was started. The results are shown on the next pages. The electrodes were used as is with no additional treatment, and including plasma treatment as described above.

Cyclic Voltammetry scans were run at 100mV/sec scan rate. Starting from -500 to +500 and back to -500mV.

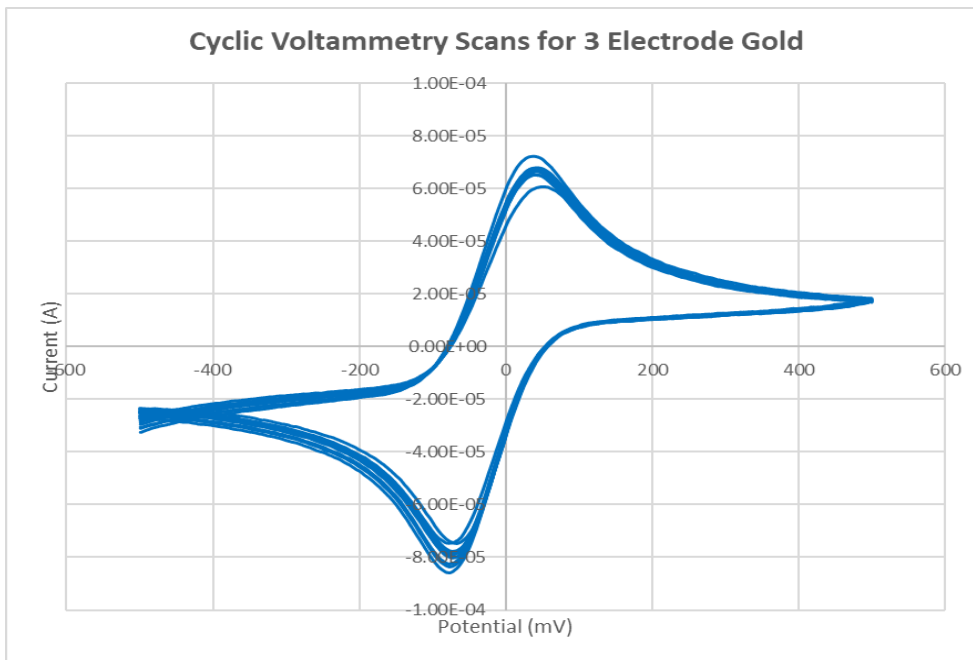
Carbon



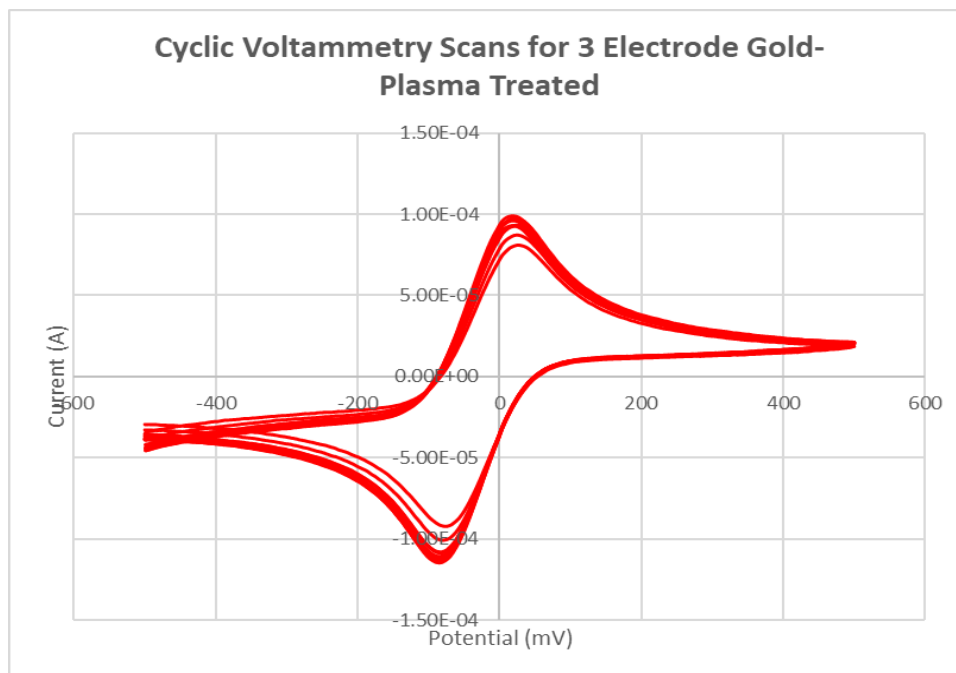
Carbon-Plasma Treated



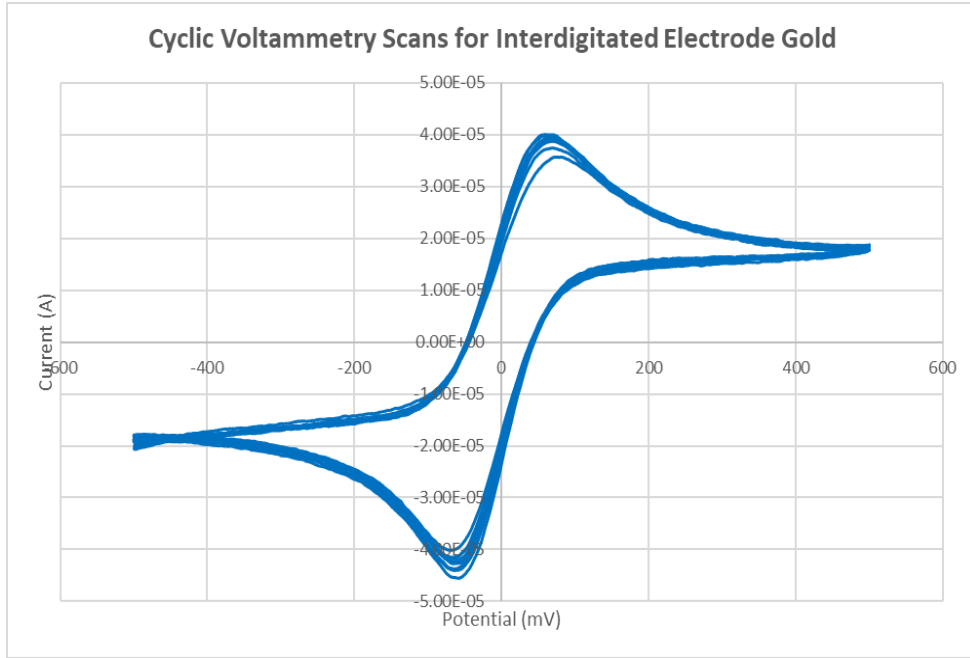
Gold



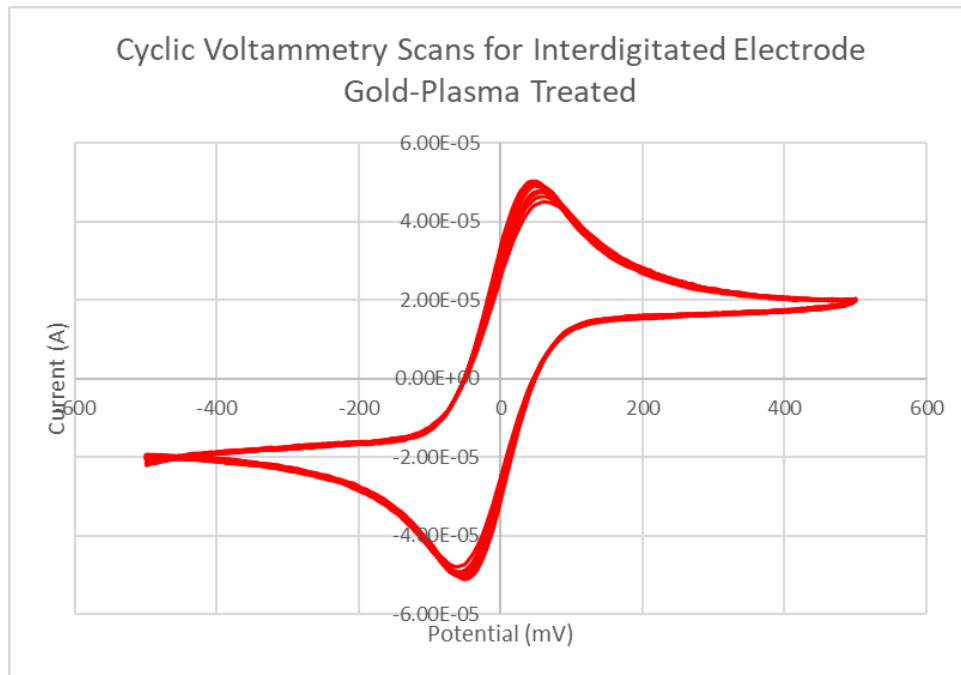
Gold-Plasma Treated



InterDigitated



InterDigitated-Plasma Treated



4. Chronoamperometric Precision

Chronoamperometric tests were run with a 400mV bias for 20sec.

Carbon

Carbon Phase 0 CA's		
Current @ 10s (uA)		
	Non-Plasma	Plasma
Ave	30.0	30.8
SD	0.5	0.3
CV%	2%	1%

Gold

Gold Phase 0 CA's		
Current @ 10s (uA)		
	Non-Plasma	Plasma
Ave	5.9	6.0
SD	0.2	0.1
CV%	3%	2%

InterDigitated

InterDigitated Phase 0 CA's		
Current @ 10s (uA)		
	Non-Plasma	Plasma
Ave	12.8	13.7
SD	0.7	0.2
CV%	6%	2%