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TECHNOLOGIES

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THINK & INNOVATE

Smart Microfluidic and Electrochemistry Solutions for Research Science

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empresa innovadora de base tecnológica reconocida por ANCES ebt

» Presentation

MicruX Technologies is an innovative technology-based company expertise in electrochemistry and microfluidic platforms, founded in 2008 and based in Oviedo (Asturias), Spain.

MicruX develops miniaturized, automated and portable analysis systems. Thus, Lab-on-a-Chip (LOC) technologies based on microfluidics and electrochemical sensors give rise to the integration of multiple steps carried out in a laboratory (sample pretreatment, mixing, reaction, separation, and detection) on a single device. These miniaturized devices enable the separation, detection, identification and quantification of compounds with analytical interest in real samples. Thus, these novel devices can be used at research and industrial level for developing innovative solutions in food, environment and health sector.

MicruX is proficient in microfluidics and electrochemical detection systems especially designed for research and educational activities. In microfluidic field, MicruX has extensive experience in developing, manufacturing and application of microfluidic electrophoresis chips. Moreover, our know-how in the electrochemistry field, allow us the design and integration of miniaturized electrochemical sensors on a simple and effective way.

MicruX also provides a new generation of analytical instrumentation in order to make easier the use of the microfluidic and electrochemical devices. Moreover, MicruX has the know-how to provide services for achieving food, environmental and clinical applications using these novel microfluidic and electrochemical devices.

MicruX contributes to make the use of microfluidic and electrochemical devices more routinary in different research fields as well as in industry.

CONTENTS

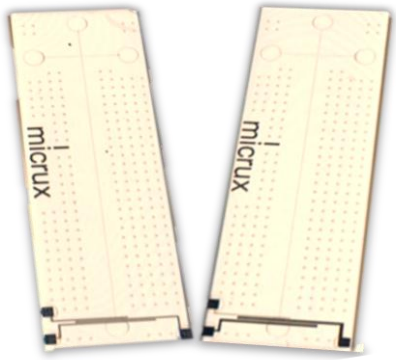
1. MICROFLUIDIC CHIPS

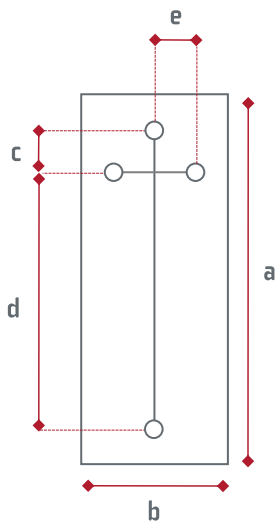
MicruX develops reusable *microfluidic electrophoresis chips* manufactured on highly resistant hybrid SU-8/Pyrex material. Microfluidic chips are fabricated with integrated electrodes or microelectrodes on the Pyrex cover plate.

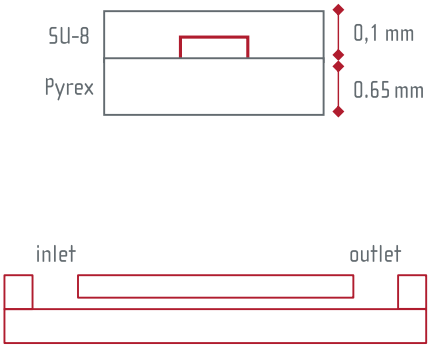
1.1. SU-8/Pyrex microfluidic chips with integrated electrodes

» SU-8/Pyrex single-channel microchips

Two crossed microchannels fabricated on EPON SU-8 resin with integrated electrodes on Pyrex cover plate.







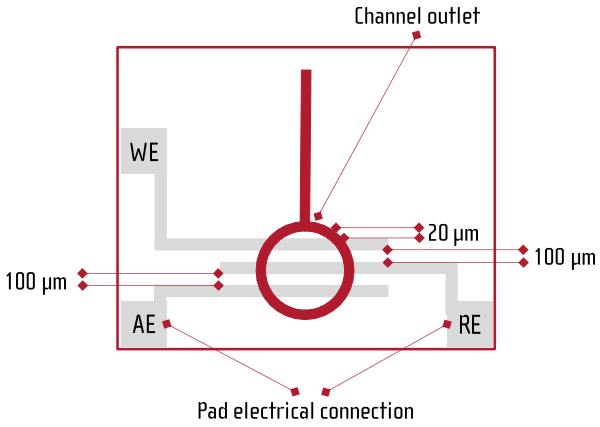
*Highly resistant hybrid **SU-8/Pyrex** material for **reusable** microfluidic chips.*

***Long life** (over 1000 runs/injections) with a low-cost, high efficiency and precision.*

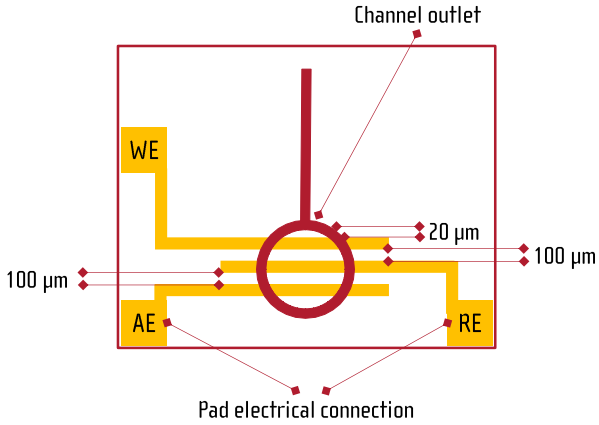
Ref.	Channel Geometry (µm)		Access holes (mm)	Microchip dimensions (mm)				
	width	depth		a	b	c	d	e
MCE-SU8-xx00XT	50	20	2	38	13	5	30	5

» Integrated electrodes

Electrodes are integrated at the outlet of the separation channel with an end-channel approach.



:: 50/150 nm titanium/platinum thin-film.



:: 50/150 nm titanium/gold thin-film.

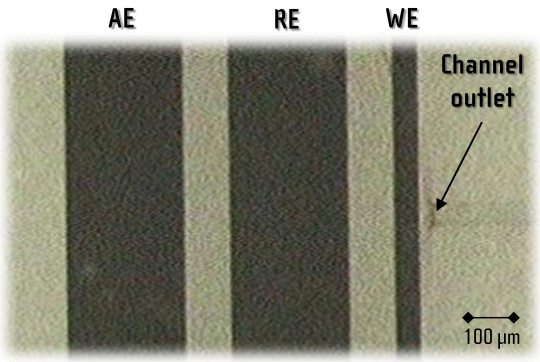
» **WE:** working electrode.
» **RE:** reference electrode.
» **AE:** auxiliary electrode.

Electrodes are available in different designs and materials:

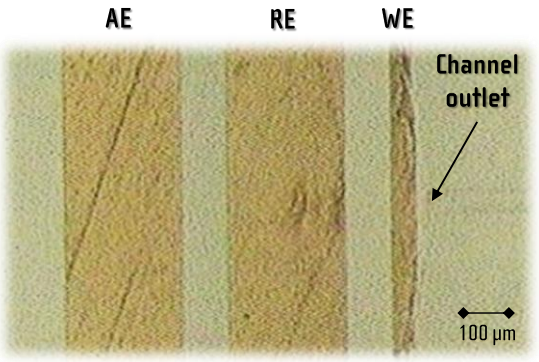
Ref.	Electrode material	Electrochemical detector – Electrode width (µm)		
		WE	RE	AE
MCE-SU8-Pt001T	Platinum	50	250	250
MCE-SU8-Au001T	Gold	50	250	250
MCE-SU8-Pt002T	Platinum	100	100	100
MCE-SU8-Au002T	Gold	100	100	100

**Customized designs of microfluidic chips and electrodes are available on demand.*

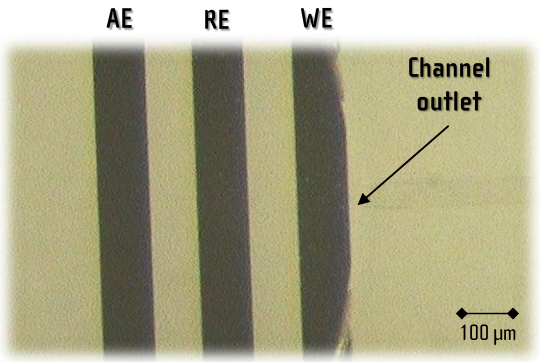
:: MCE-SU8-Pt001T



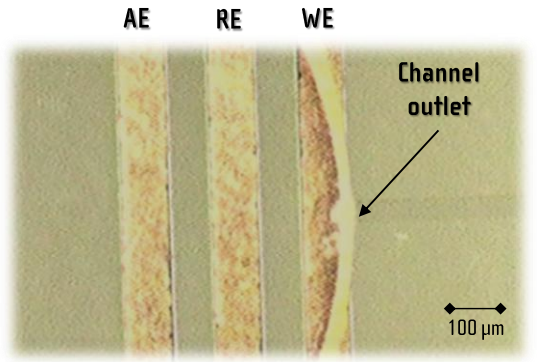
:: MCE-SU8-Au001T



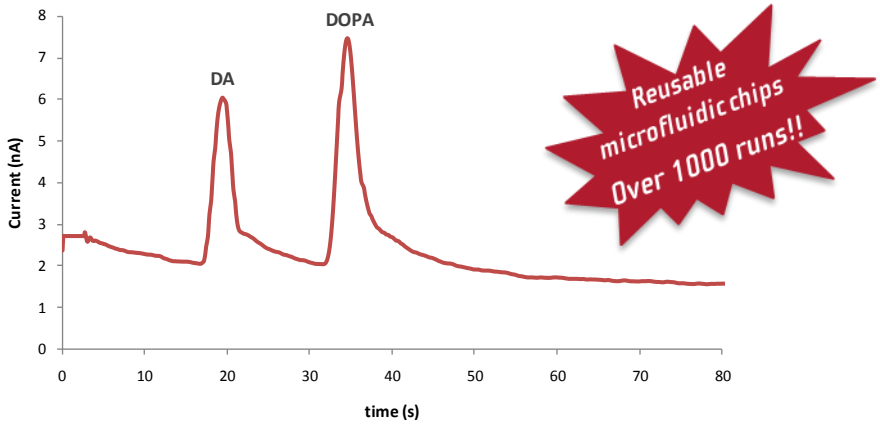
:: MCE-SU8-Pt002T



:: MCE-SU8-Au002T



Separation of neurotransmitters dopamine (DA) and DOPA performed using a ***SU-8/pyrex microchip*** (*ref. MCE-SU8-Pt001T*) in combination with the microfluidic platform (*ref. MCE-HOLDER-SC01*) and MicruX® HVStat instrument (*ref. HVSTAT2010*).

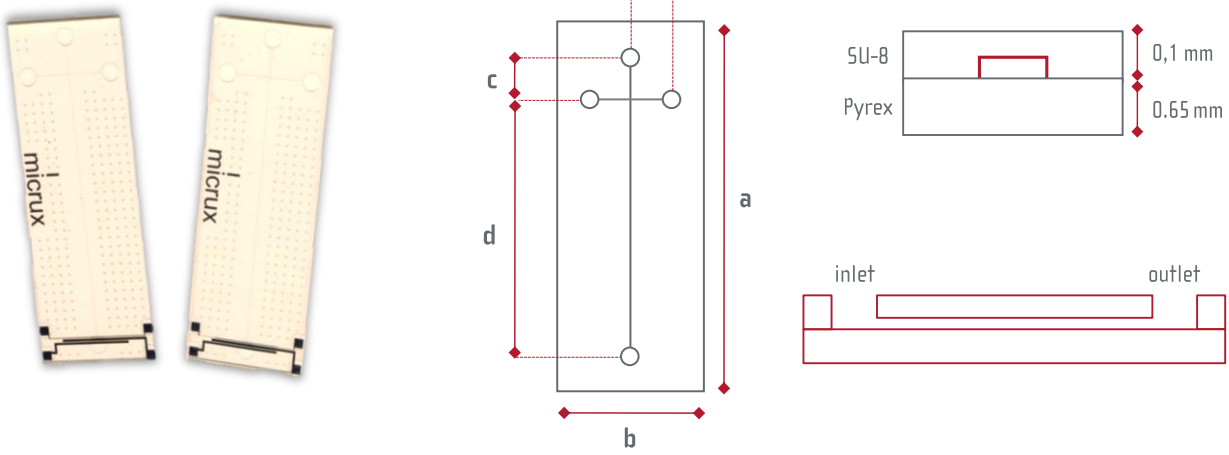


Electropherogram for the separation of 100µM DA and 500µM DOPA using a SU-8/pyrex single-channel microchip. Conditions: Running buffer: 25mM MES-His pH = 6.0; V_{inj} = +750V for 5s, V_{sep} = +1000V, E_d = +0.75V (vs. Pt)

1.2. SU-8/Pyrex microfluidic chips with integrated microelectrodes

SU-8/Pyrex microchips are also provided with integrated microelectrodes on the Pyrex cover plate. The working electrode is available in two different configurations: *microelectrode array* **(MEA)** and *interdigitated array* **(IDA).**

Two crossed microchannels fabricated on EPON SU-8 resin with integrated microelectrodes on Pyrex cover plate.



*Highly resistant hybrid **SU-8/Pyrex** material for **reusable** microfluidic chips.*

***Long life** (over 1000 runs/injections) with a low-cost, high efficiency and precision.*

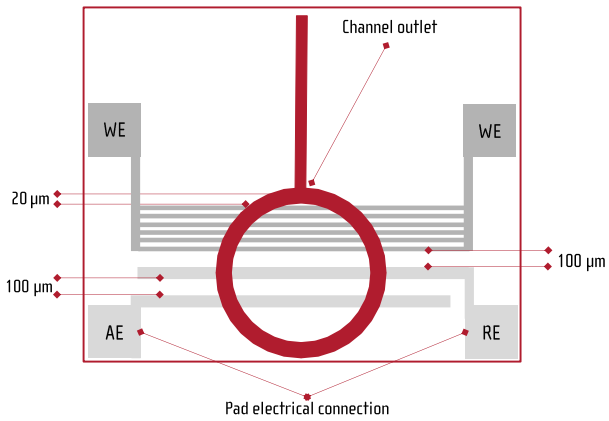
Ref.	Channel Geometry (µm)		Access holes (mm)	Microchip dimensions (mm)				
	width	depth		a	b	c	d	e
MCE-SU8-YYY-xx00XT	50	20	2	38	13	5	30	5

» SU-8/Pyrex single-channel microchips with microelectrode array (MEA)

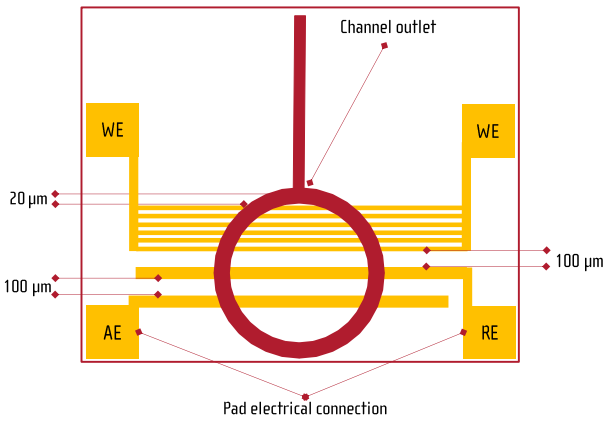
The electrochemical detection (ED) system consists of six 10-µm microelectrodes with an array approach.

» Integrated microelectrode array

Electrodes integrated at the outlet of the separation channel with an end-channel approach. A 10-µm gap is shown between microelectrodes of array (WE).



:: 50/150 nm titanium/platinum thin-film.



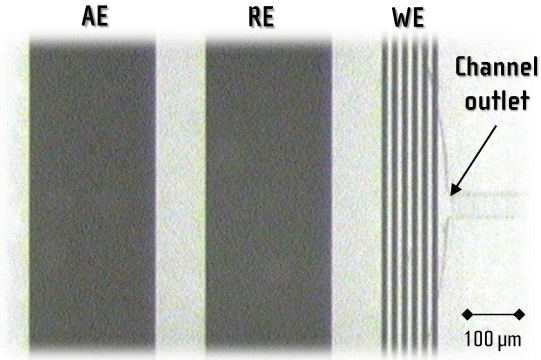
:: 50/150 nm titanium/gold thin-film.

» **WE:** working electrode.
» **RE:** reference electrode.
» **AE:** auxiliary electrode.

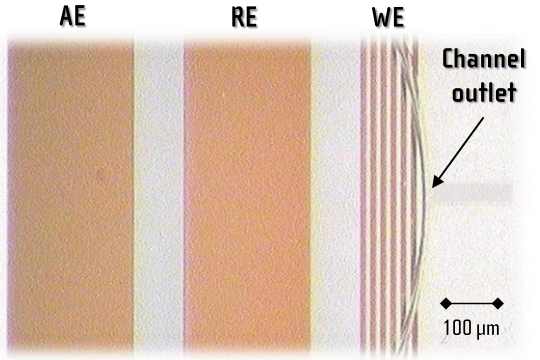
Electrodes are available in different materials:

Ref.	Electrode material	Electrochemical detector – Electrode width (µm)		
		WE	RE	AE
MCE-SU8-MEA-Pt004T	Platinum	6x10	250	250
MCE-SU8-MEA-Au004T	Gold	6x10	250	250

:: MCE-SU8-MEA-Pt004T



:: MCE-SU8-MEA-Au004T

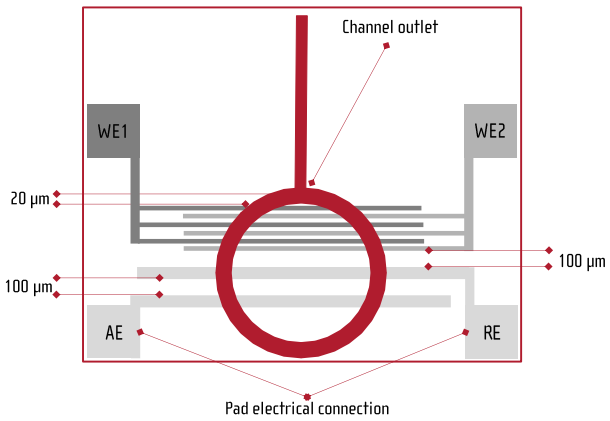


» SU-8/Pyrex single-channel microchips with interdigitated array (IDA)

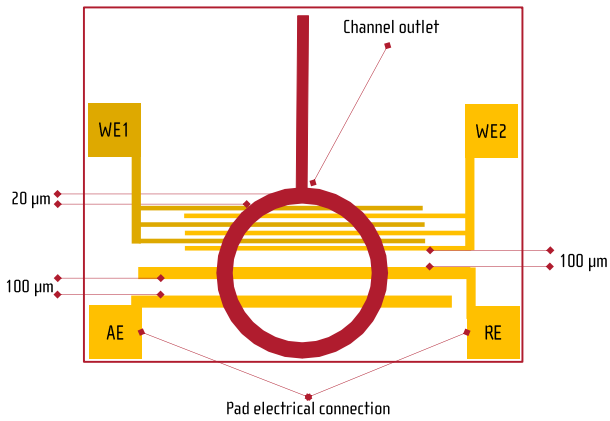
The electrochemical detection (ED) system consists of two arrays with three 10-µm microelectrodes with an interdigitated approach.

» Integrated interdigitated array

Electrodes integrated at the outlet of the separation channel with an end-channel approach. A 10-µm gap is shown between microelectrodes of interdigitated array (WE1/WE2).



:: 50/150 nm titanium/platinum thin-film.



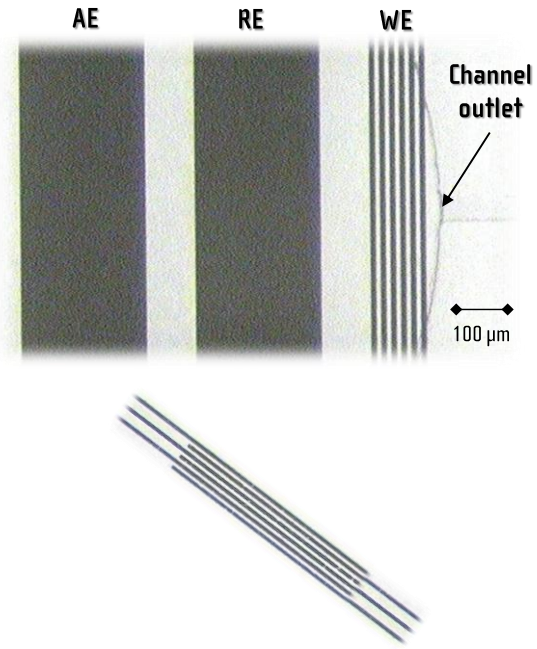
:: 50/150 nm titanium/gold thin-film.

» **WE1/WE2:** working electrodes.
» **RE:** reference electrode.
» **AE:** auxiliary electrode.

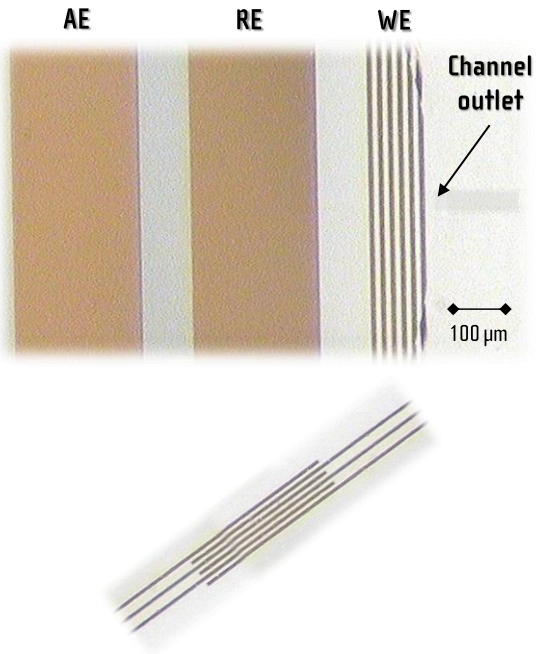
Electrodes are available in different materials:

Ref.	Electrode material	Electrochemical detector – Electrode width (µm)		
		WE	RE	AE
MCE-SU8-IDA-Pt005T	Platinum	2x(3x10)	250	250
MCE-SU8-IDA-Au005T	Gold	2x(3x10)	250	250

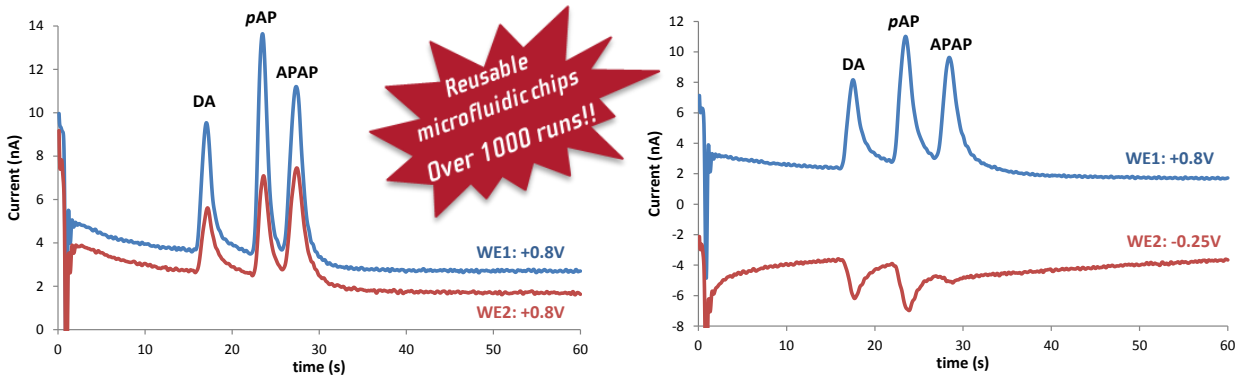
:: MCE-SU8-IDA-Pt005T



:: MCE-SU8-IDA-Au005T



Separation of phenolic compounds performed using a ***SU-8/pyrex microchip with integrated IDA microelectrode*** (*ref. MCE-SU8-IDA-Pt005T*) in combination with the microfluidic platform (*ref. MCE-HOLDER-DC02*) and MicruX® HVStat instrument (*ref. HVSTAT2010*).



Electropherograms for the separation of 100µM DA, 100µM pAP and 250µM APAP using a SU-8/pyrex single-channel microchip with an IDA microelectrode applying same and different detection potentials. Conditions: Running buffer: 20mM MES pH = 6.0; V_{inj} = +750V for 3s, V_{sep} = +1000V.

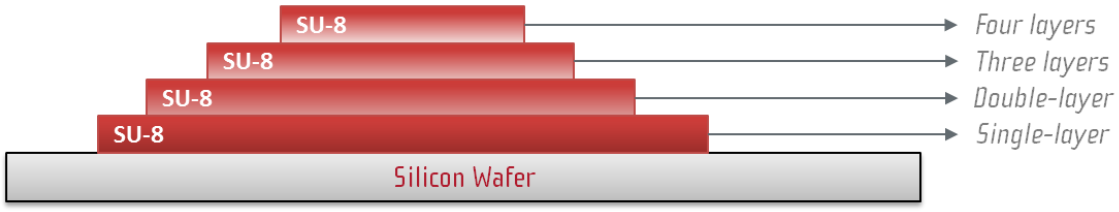
1.3. Multilayer SU-8 mould on silicon wafers

Multilayer SU-8 microstructures can be manufactured on a Silicon wafer in order to get master moulds with high precision and resolution.

» Multi-layer mould basic features

» Mould dimensions:	4 inch wafers (≈ 100 mm). The effective area for the structures in the mould is 90 mm Ø.
» Substrate material:	Silicon (other substrates; pyrex, glass, polymers, may be available on demand)
» Structures material:	SU-8 resin
» Structures layers:	Up to 4 layers
» Typical aspect ratio:	1:3 (Width:Height). Other aspect ratio available on demand.
» Minimal features:	Height: 15 µm Width: 10 µm
» Tolerance:	Height: <10% Width: <2 µm

Up to four SU-8 layers can be patterned with high aspect ratio on silicon substrates:



Silicon wafer could be cut on smaller rectangular pieces in order to get individual masters. Other technical features can be fulfilled under request.

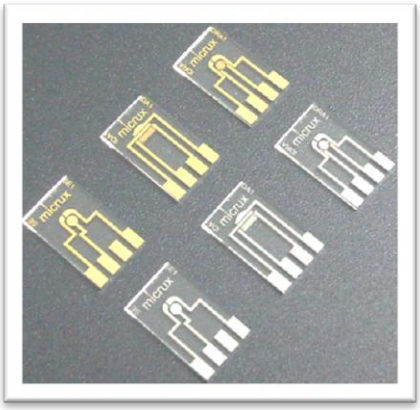
» Applications

SU-8 master moulds provide a cost-effective and useful tool for soft casting polymers (*like PDMS*) as well as hot-embossing processes.

2. ELECTROCHEMICAL SENSORS

MicruX develops metal-based (micro)electrodes fabricated by thin-film technologies on a Pyrex substrate. A SU-8 resin protective layer is used to delimit the electrochemical cell enabling the use of very small sample volume.

» Thin-film electrodes main features



» Standard dimensions:	10 x 6 x 0.75 mm
» Substrate:	Pyrex
» Protective layer:	SU-8 resin
» Electrochemical cell:	2 mm Ø
» Sample volume:	1 – 5 µL
» Electrode material:	Platinum or Gold

The inherent properties of the thin-film (micro)electrodes such as low cost & disposables, reusable, high fabrication resolution, high sensitivity, low reagent consumption as well as non-tedious pre-cleaning procedures provide a suitable tool for multiple applications.

Electroanalysis	Flow Systems & Microfluidics	Nanotechnology	Biosensors
✓ Study EC reactions	✓ FIA Systems	✓ Modified electrodes	✓ EC transducers
✓ Trace EC Analysis	✓ Microchips Electrophoresis	✓ New nanostructures	✓ New recognition elements
✓ In-vivo measurements	✓ Capillary Electrophoresis	✓ New nanomaterials	✓ POC systems
✓ Redox cycling	✓ HPLC		

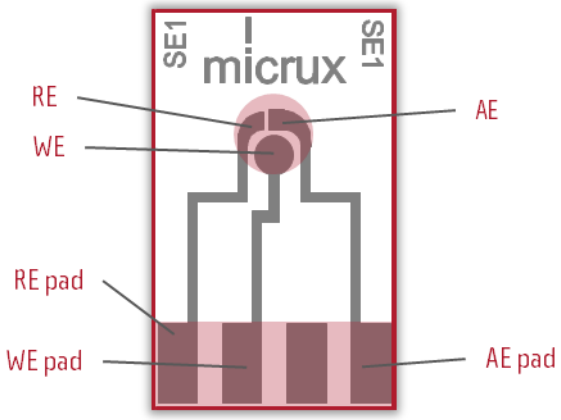
Electrochemical sensors are available in different standard designs and materials.

2.1. Thin-film single-electrodes (SE)

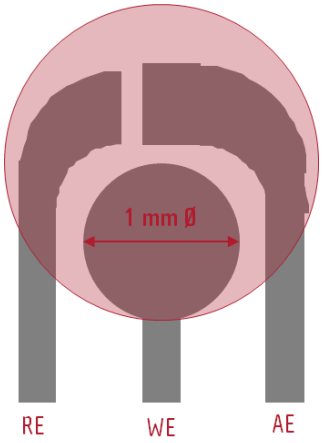
» Thin-film platinum & gold single-electrodes

Electrochemical sensors SE are based on a three-electrode (working - WE, reference - RE and auxiliary - AE) approach. The three electrodes are fabricated in the same material (*platinum* or *gold*) with high precision and resolution.

» Electrochemical SE sensor design

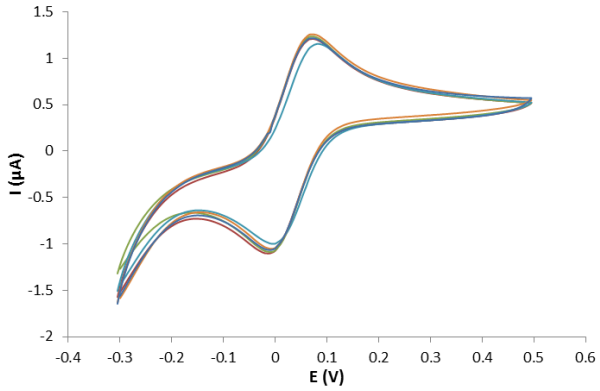


» Electrochemical cell

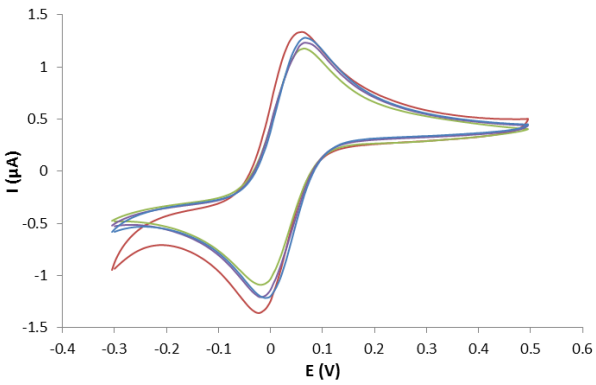


Reference	Electrodes Material	WE size	Electrodes thickness
» *ED-SE1-Pt*	Titanium / Platinum	1mm diameter	50/150 nm
» *ED-SE1-Au*	Titanium / Gold	1mm diameter	50/150 nm

Thin-film metal-based electrodes show an excellent electrochemical behavior with a good intra- and inter-electrode reproducibility.



*Cyclic voltammograms for 1 mM $K_4Fe(CN)_6$ in 0.1 M KCl at **different** thin-film Pt electrodes (**ED-SE1-Pt**). v = 50 mV/s, n = 5, **RSD = 4%***

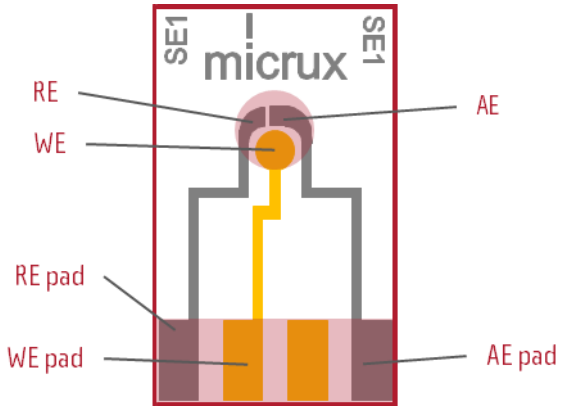


*Cyclic voltammograms for 1 mM ferrocene methylalcohol in 0.05 M H_2SO_4 at **different** thin-film Au electrodes (**ED-SE1-Au**). v = 50 mV/s, n = 4, **RSD = 6%***

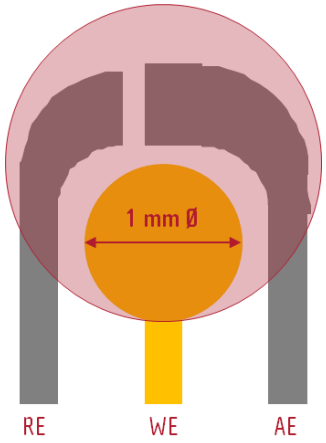
» Thin-film double-metal single-electrodes

Double-metal thin-film electrochemical sensors are based on a three-electrodes approach with a *gold* working electrode (WE) and *platinum* reference (RE) & auxiliary (AE) electrodes. The combination of two different metal electrodes in the same EC cell enables the *modification* of the working electrode surface selectively without affecting the surface of the reference and auxiliary electrodes.

» Electrochemical double-metal SE sensor design

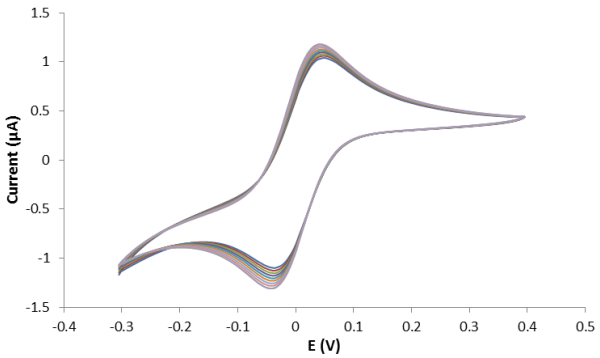


» Electrochemical cell

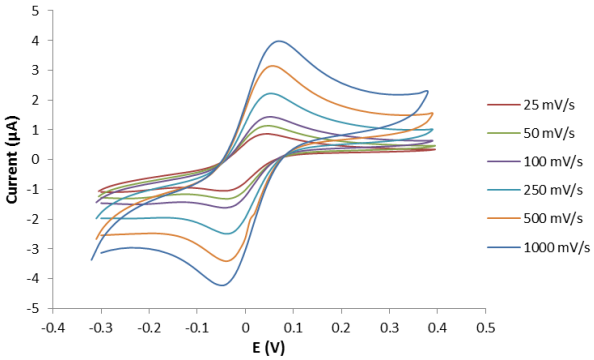


Reference	Electrodes Material *WE*	*RE*	*AE*	WE size	Electrodes thickness
» *ED-SE1-AuPt*	Ti / Au	Ti / Pt	Ti / Pt	1mm diameter	50/150 nm

Thin-film double-metal electrodes show an excellent electrochemical behavior with a good reproducibility.



*Successive cyclic voltammograms for 1 mM $K_4Fe(CN)_6$ in 0.1 M KCl at the **same** thin-film Au electrode (**ED-SE1-AuPt**). v = 50 mV/s, n = 10, **RSD = 3%***

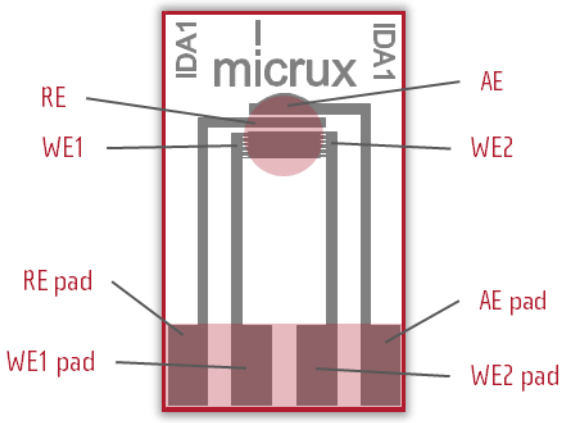


*Cyclic voltammograms for 1 mM $K_4Fe(CN)_6$ in 0.1 M KCl using different **scan rates** at a thin-film Au electrode (**ED-SE1-AuPt**).*

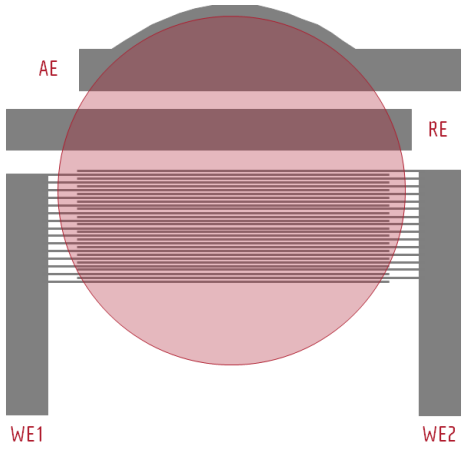
2.2. Thin-film interdigitated microelectrode array (IDA)

Thin-film technologies enable the fabrication of microelectrodes (<25 µm) with high resolution and precision. Interdigitated array (IDA) electrodes take advantages of the microelectrodes features enhancing the *sensitivity* and *detection limits*. The working electrode consists of two individually addressable arrays of microelectrodes with an interdigitated approach.

» Electrochemical IDA sensor design



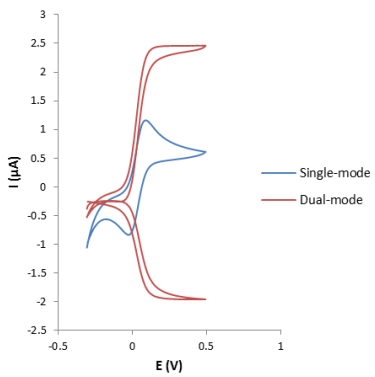
» Electrochemical cell



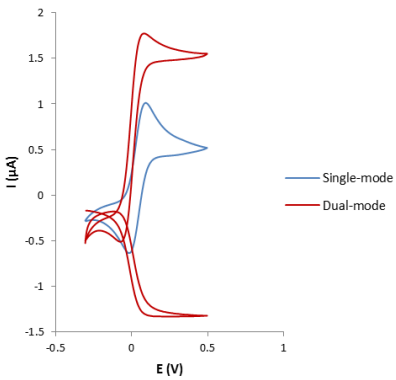
» IDA working electrode

Reference	Material	µElectrode width	µElectrode gap	Number of feet	Thickness
» *ED-IDA1-Pt*	Ti/Pt	10 µm	10 µm	15 pairs	50/150 nm
» *ED-IDA1-Au*	Ti/Au	10 µm	10 µm	15 pairs	50/150 nm

Thin-film IDA electrodes could be used in ***single-*** or ***dual-mode***. Dual-mode enables the microelectrode behavior, reaching the steady-state in a short time and enhancing the analytical signals.



Cyclic voltammograms for 1 mM $K_4Fe(CN)_6$ in 0.1 M KCl using single- and dual-mode at a Platinum IDA electrode.

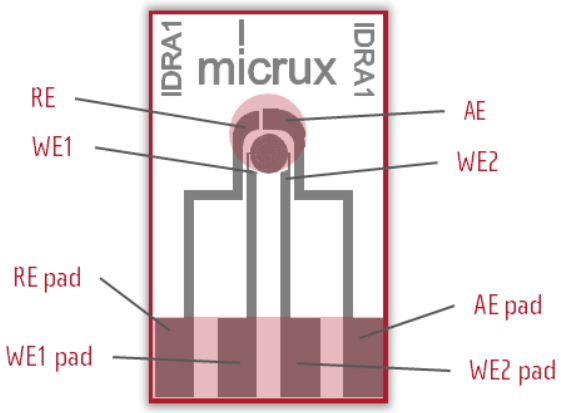


Cyclic voltammograms for 1 mM ferrocene methylalcohol in 0.1 M H_2SO_4 using single- and dual-mode at a Gold IDA electrode.

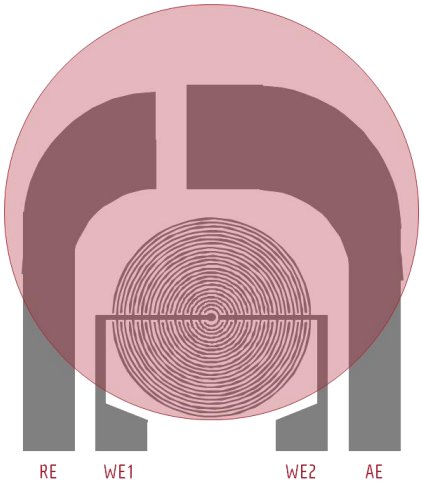
2.1. Thin-film interdigitated ring array (IDRA)

Thin-film technologies open the gate to develop special microelectrodes designs. Interdigitated ring array (IDRA) electrodes bring a radial design specially focused on flow systems. The working electrode consists of two radial arrays of microelectrodes with an interdigitated approach.

» Electrochemical IDRA sensor design



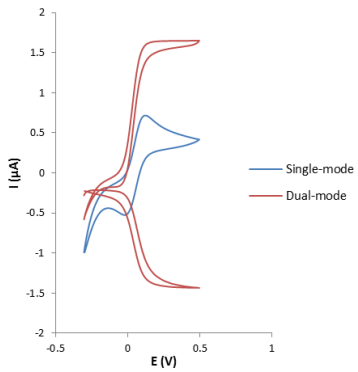
» Electrochemical cell



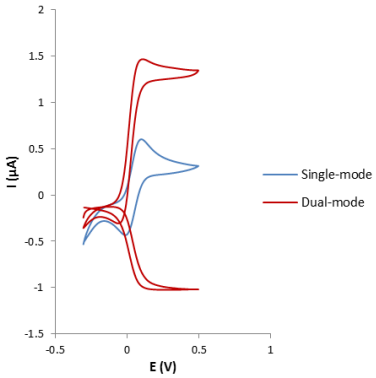
» IDRA working electrode

Reference	Material	µElectrode width	µElectrode gap	Number of feet	Thickness
» *ED-IDRA1-Pt*	Ti/Pt	10 µm	10 µm	12 pairs	50/150 nm
» *ED-IDRA1-Au*	Ti/Au	10 µm	10 µm	12 pairs	50/150 nm

Dual-mode enables the microelectrode behavior, reaching the steady-state in a short time and enhancing the analytical signals



Cyclic voltammograms for 1 mM $K_4Fe(CN)_6$ in 0.1 M KCl using single- and dual-mode at a Platinum IDRA electrode.



Cyclic voltammograms for 1 mM ferrocene methylalcohol in 0.1 M H_2SO_4 using single- and dual-mode at a Gold IDRA electrode.

3. INSTRUMENTATION

An additional instrumentation such as high-voltage power supplies and potentiostat is required to use the microfluidic chips and electrochemical sensors.

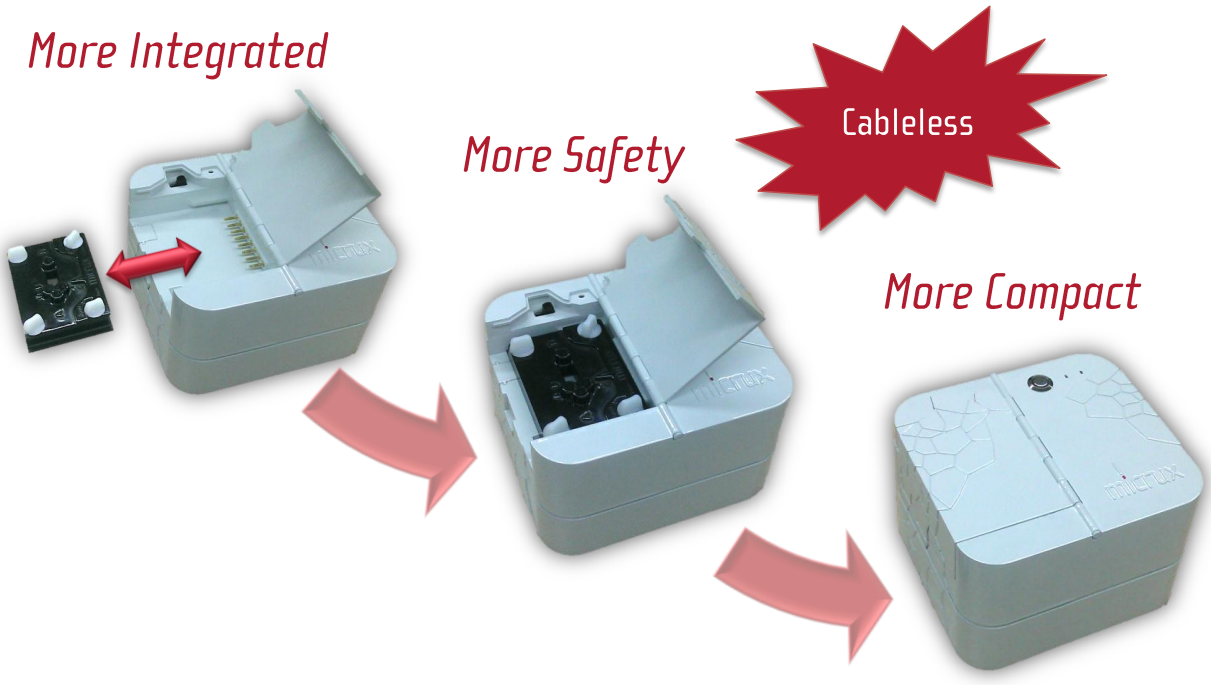
MicruX manufactures a new generation of instruments for using microfluidic electrophoresis chips with integrated electrochemical detection as well as other microfluidic devices.

3.1. Automated microfluidic electrophoresis systems

» MicruX® iHVStat

iHVStat (***ref. iHVSTAT2012)*** brings the new evolution of electrophoresis systems based on *microfluidic chips* with *amperometric detection*.

- » **Dimensions:** 165 x 150 x 95 mm *(L x W x H).*
- » **Battery**-powered (LiPo – 3300 mAh).
- » Control PC **software.**
- » **Interfacing:** Serial RS232/ USB Adapter/ wireless (Bluetooth®).
- » **LED indicators:** power, Bluetooth®, cable.



» MicruX® HVStat

HVStat (***ref. HVSTAT2010***) was the first microfluidic electrophoresis system that combined in a portable equipment a *high voltage power supply* and a *bipotentiostat* for dual amperometric detection. In this model, external cables are used for connecting the microfluidic platform with microchips electrophoresis.

- **Dimensions:** 165 x 150 x 85 mm *(L x W x H).*
- **Battery**-powered (LiPo – 3300 mAh).
- Control PC **software.**
- **Interfacing:** Serial RS232/ USB Adapter/ Bluetooth®.
- **LED indicators:** power, Bluetooth®, cable.

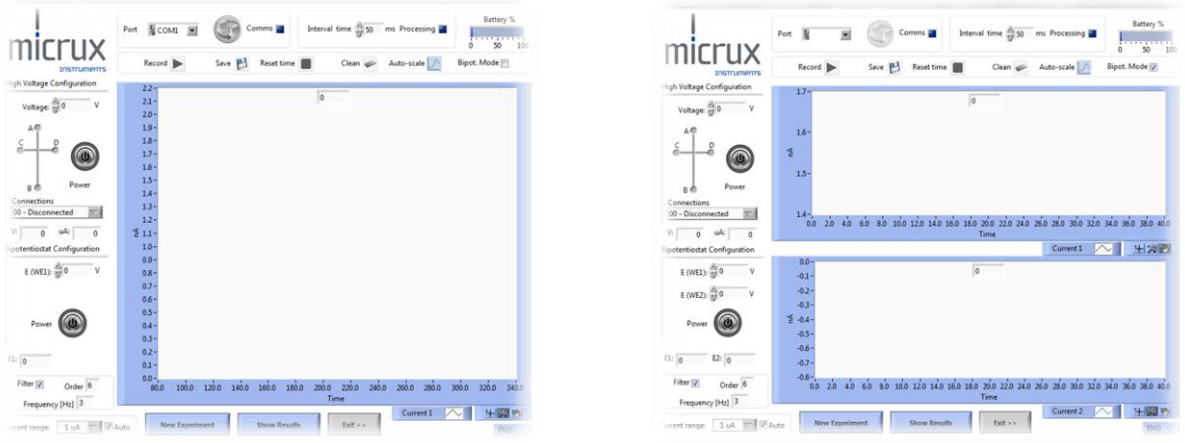
TECHNICAL FEATURES: High Voltage Power Supply	
» **Power:**	1W
» **Channels/ outputs:**	1/ 4
» **Outputs polarity:**	Positive/negative
» **Output voltage:**	±3000V
» **Max. output current:**	0,34mA
» **Ripple:**	< 1%
» **Operating temperature:**	-20°C to +70°C
» **Storage temperature:**	-20°C to +105°C
» **Humidity:**	20% to 85% RH

TECHNICAL FEATURES: Bipotentiostat	
» **DC-potential range:**	± 2,00V
» **DC-potential resolution:**	1mV
» **DC-offset error:**	± 1mV
» **Accuracy:**	≤ 0,1%
» **Current ranges:**	1nA to 1µA (4 ranges)
» **Maximum current:**	± 2µA
» **Current resolution:**	0,1% of current range / 1pA on lowest current range
» **Electrochemical techniques:**	DC amperometric detection (AD) Pulsed amperometric detection (PAD)
» **Run time:**	1s - ∞ (Experiments 1s – 1000h)
» **Interval time:**	10ms - 1000s (RS232/ USB)
» **Pulse time:**	5ms - 1000s (RS232/ USB)
» **Maximum number of points:**	No limited (depending of computer memory)

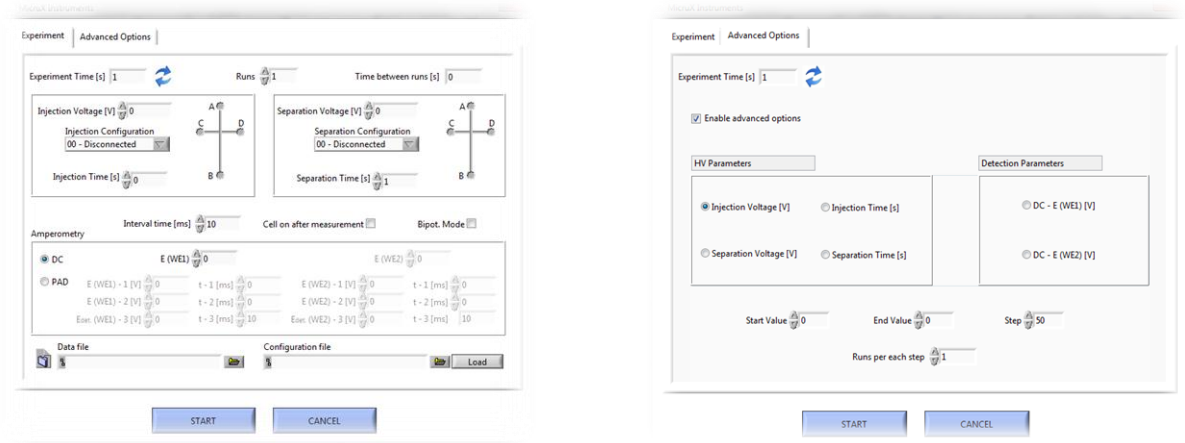
MicruX® ***HVStat*** & ***iHVStat*** instruments are provided in a suitcase with all the necessaries accessories for connecting it to a PC and using the microfluidic devices.

» MicruX® Manager software

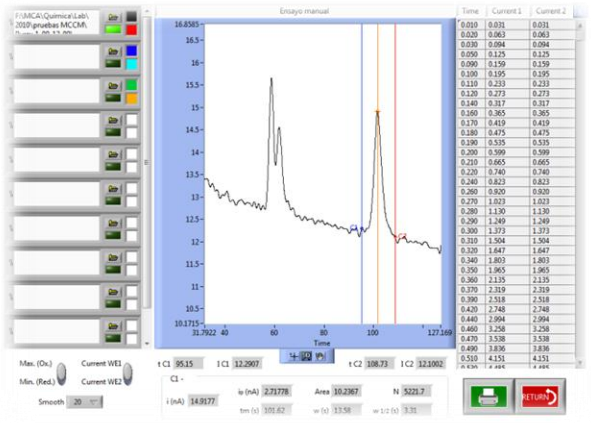
MicruX Manager is a *graphical user interface (GUI)* to control the high voltage power supply and bipotentiostat of **HVStat** & **iHVStat**.



MicruX Manager main interface for single- and dual-mode detection



MicruX Manager experiment window with basic and advanced options



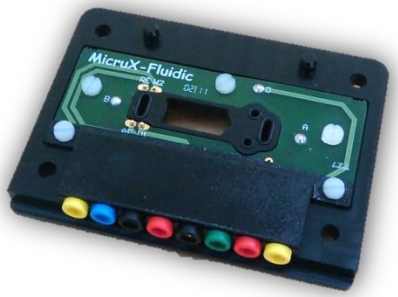
MicruX Manager results window

4. MICROFLUIDIC & ELECTROCHEMICAL PLATFORMS

4.1. Microfluidic Platform DC series

The platform DC (***ref. MCE-HOLDER-DC02***) is a perfect complement for using in combination with *MicruX® HVStat & iHVStat*. The microfluidic platform is the most new friendly interface for easy use of single- & dual-channel microchips with integrated electrochemical detection (including MEAs and IDAs).

» Technical characteristics



» **Dimensions:** 100 x 65 x 15 mm (L x W x H).

» **Material:** black-methacrylate.

» **Integrated wells** (buffer solution, sample, waste and detection reservoir) with standard fluidic ports (1/4”-28 UNF thread).

» **High voltage electrodes**: Platinum (300 µm Ø) integrated on the cover.

» **Electrical contacts** for detection and voltage electrodes on integrated PCB.

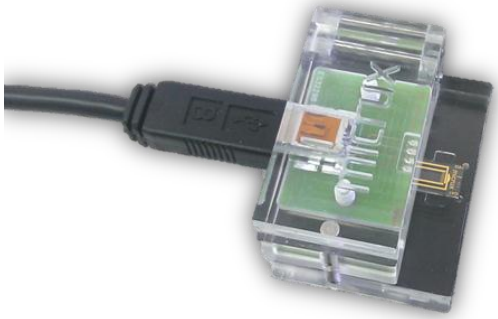
» **Integrated 2-mm female bananas** for instruments connection.

» **Reusable.**

» It can be used with **standard microfluidic electrophoresis chips** (38 x 13 mm) with integrated electrodes for single- & dual-mode amperometric detection.

4.2. Drop-cell interface

The drop-cell connector (***Ref. ED-DROP-CELL***) provides a true user-friendly interface with the potentiostat, enabling the use of microvolume (1 – 5 µL sample drops) with all standard (10 x 6 mm) thin-film (micro)electrodes.



» **Dimensions:** 40 x 30 x 25 mm (WxDxH)

» **Material**: aluminium base + methacrylate cover

» **User friendly** (tool free assembly).

» **Easy** and **fast replacement** of the electrodes.

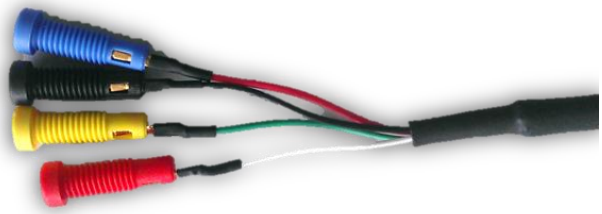
» **High quality** robust connector.

» **Reusable** – long-life.

The drop-cell connector and flow-cell (***ref. ED-FLOW-CELL***) are supplied with a universal cable compatible with any commercial potentiostat.

miniUSB to EC Drop/Flow-cell

Female/male banana plug to potentiostat



Plug to potentiostat may be available in other format under previous request.

4.3. Electrochemical Flow-cell

Wall-jet electrochemical flow-cell (***ref. ED-FLOW-CELL***) for using thin-film (micro)electrodes as EC detection system in flowing liquids such as FIA, LC, HPLC, CE, etc… The flow-cell enables the use of all standard (10 x 6 mm) thin-film (micro)electrodes.

» **Dimensions:** 50 x 40 x 30 mm (WxDxH)

» **Material**: aluminium base + methacrylate cover (transparent)

» **Wall-jet** based flow-cell.

» Standard **fluidic ports** (¼ ” - 28 UNF).

» **Low dead-volume** (internal volume of the cell <500 nL).

» **High sensitivity** EC measurements.

» **Low sample** requirements (microvolume < 20 µL).

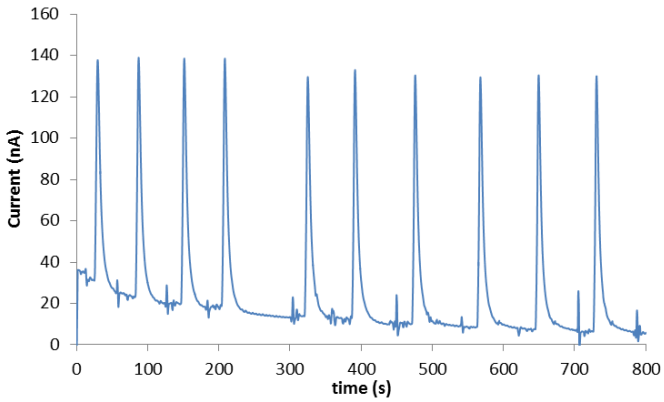
» **User friendly** (tool free assembly).

» **Easy** and **fast replacement** of the electrodes.

» **Reusable**.

The electrochemical flow-cell offers a suitable solution to take advantage of the small thin-film (micro)electrodes in flow injection analysis systems.

Amperometric measurements in a Flow Injection Analysis (FIA) system using the EC flow-cell and MicruX HVStat instrument (*ref. HVSTAT2010*).



Successive injections of $1 \cdot 10^{-5}$ M pAP in the FIA system using a thin-film Pt single-electrode (ED-SE1-Pt). Carrier: 0.1 M PBS, pH = 7.4, flow rate = 0.5 mL/min, E_d = +0.4 V. RSD = 4%, n = 10.

5. TEACHING PACKS

MicruX develops laboratory practice protocols for using the miniaturized instrumentation as teaching tool. These practices are focused on Analytical Chemistry Practical Courses (clinical, pharmaceutical, environmental, food and beverage analysis) for undergraduate & postgraduate students.

The aim of these practices is to increase the knowledge of students about principles and applications of capillary electrophoresis technique as well as electrochemistry.

Different packs are available for each practice, from a *full-* to a *basic-pack*, in order to fulfill the particular necessities of all educational centers.

5.1. Full Pack *(MXF-PLAB-FP)* & iPack *(MXF-iPLAB-FP)*

The most complete pack includes all the tools necessaries for introducing the students in the use of miniaturized instrumentation and microfluidic devices.

» Pack content

» MicruX® **HVStat** (or **iHVStat** for iPack) Instrument + Accessories (*Ref. HVSTAT2010 or iHVSTAT2012*).

» Microchip **Holder** DC series (*Ref. MCE-HOLDER-DC02*).

» **Microchips** electrophoresis with integrated electrodes *(Ref. MCE-SU8-Pt001T*).

» **Teacher's guide:** includes detailed description of the experiments with the most relevant theoretical and practical aspects.

» **Student's guide:** includes a brief description about the main outlines of the experiments to be performed.

» **Excel Template:** for collecting the experimental data and studying the results.

» **Reagents:** specific chemicals for preparing the standard and buffer solutions.

» **Other material** (syringes, filters, sample containers…) necessary for carrying out the experiments.

5.2. Standard Pack *(MXF-PLAB-SP)*

» Pack content

» **Microchips** electrophoresis *(Ref. MCE-SU8-Pt001T*).

» **Teacher's guide**.

» **Student's guide**.

» **Excel Template.**

» **Reagents.**

» **Other material** (syringes, filters, sample containers…).

5.3. Basic Pack *(MXF-PLAB-BP)*

» Pack content

» **Teacher's guide**.

» **Student's guide**.

» **Excel Template.**

» **Reagents.**

» **Other material** (syringes, filters, sample containers…).

5.4. Spare Kit *(MXF-PLAB-SK)*

» Pack content

» **Reagents.**

» **Other material** (syringes, filters, sample containers…).

» Teaching Packs

Several practical protocols are being developed in order to involve different relevant fields such as health, environment, food and beverage.

Lab Practice Protocol I

» Analysis of uric acid and related compounds in urine sample using ME-ED

Lab Practice Protocol II

» Analysis of paracetamol and vitamin C in pharmaceuticals using ME-ED

6. ACCESSORIES & REAGENTS

MicruX provides any additional complementary tools as well as reagents necessaries to suitable work with microfluidic devices, electrochemical sensors and portable analytical instrumentation.

» Electrochemical sensor test connector

» Ref. ED-CONN-BOX

Simple and universal connector for an easy starting test of the thin-film (micro)electrodes with the potentiostat. The electrode connector is compatible with any commercial potentiostat.

Dimensions: 60 x 40 x 20 mm

» High voltage cable

» Ref. MXF-HVCAB

High voltage cable for using in combination with *MicruX® HVStat* to connect the HV electrodes.

Cable dimensions: 50 cm long

» Bipotentiostat cable

» Ref. MXF-BIPOTCAB

Bipotentiostat cable for using in combination with *MicruX® HVStat* to connect the electrodes of detection system.

Cable dimensions: 50 cm long

» REAGENTS – Buffer solution

» *Ref. MXF-MES*

Buffer substance provided as single dose specially developed to carry out electrophoresis separations in microfluidic devices with electrochemical detection. Buffer is available in different pH between 5.0 and 7.0.

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