

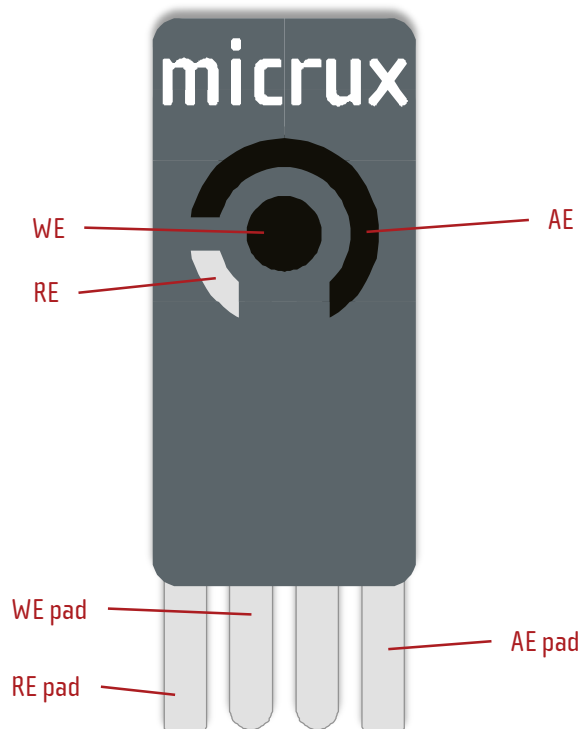


Thick-film Carbon Single-Electrodes



Thick-film carbon electrodes (ED-51PE-C) are fabricated by printing technologies on a flexible and high-resist PET substrate. These low-cost and disposable electrochemical sensors enable the use of **small sample volume**.

» Thick-film based-electrode features



Printing technologies enable the manufacture of planar electrodes suitable for working with sample microdrop.

- » **Standard dimensions:** 27.5 x 10.1 mm
- » **Substrate:** PET (white)
- » **Substrate thickness:** 350 μm
- » **WE dimensions:** 3 mm \varnothing (7,1 mm²)
- » **Sample volume:** 20 – 50 μL
- » **Electrode material**
 - Working electrode (WE): Carbon
 - Reference electrode (RE): Silver
 - Auxiliary electrode (AE): Carbon

» Thick-film electrode packs

Thick-film 51PE electrodes are supplied in **50 units packs**. They should be stored at room temperature in a dry place.

» Applications

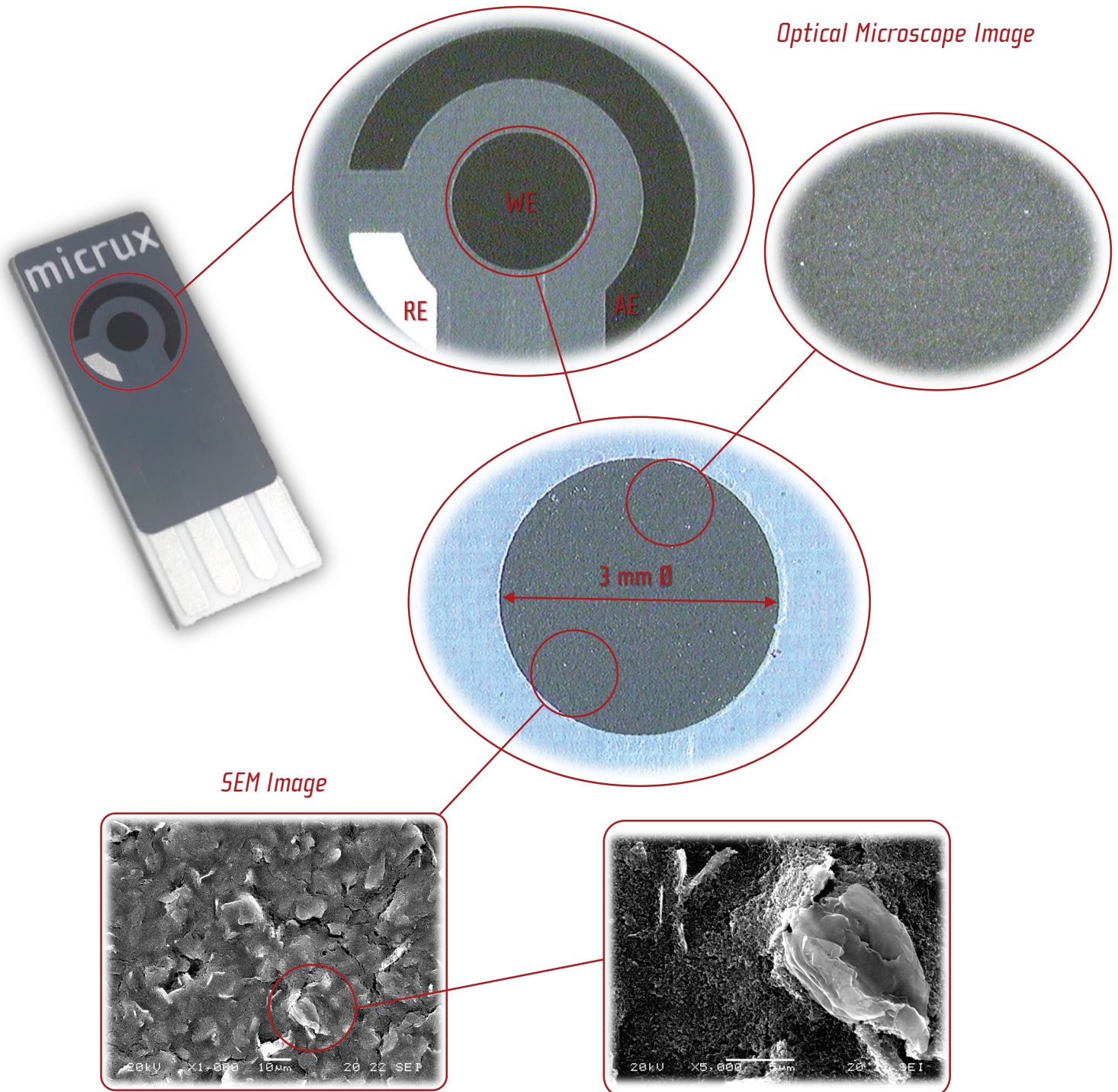
Printed electrodes are a suitable tool for **multiple applications**, providing many advantages such as low-cost, disposable, low reagent consumption as well as non-tedious pre-cleaning procedures.

Electroanalysis	Nanotechnology	Biosensors	Flow Analysis Systems
<ul style="list-style-type: none"> ✓ Study EC reactions ✓ Trace EC analysis ✓ In-vivo measurements 	<ul style="list-style-type: none"> ✓ Modified electrodes ✓ New nanostructures ✓ New nanomaterials 	<ul style="list-style-type: none"> ✓ EC transducers ✓ New recognition elements ✓ POC / wearable systems 	<ul style="list-style-type: none"> ✓ FIA Systems ✓ HPLC ✓ Capillary Electrophoresis



» Electrochemical cell

Carbon (*Ref. ED-51PE-C*) thick-film electrochemical sensors are based on a classical three-electrodes (working – WE, reference – RE and auxiliary – AE) approach.

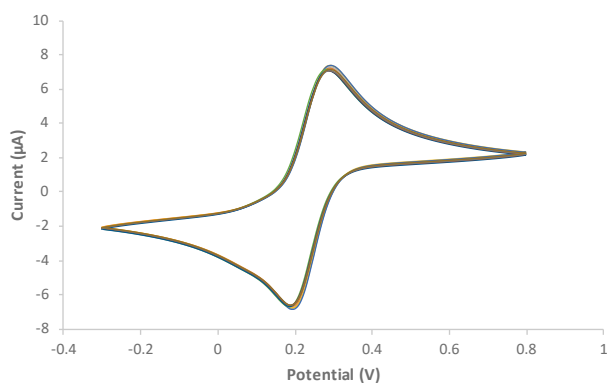


Printed-based electrodes are very useful in order to avoid tedious polishing of traditional solid electrodes, and make easier the development of **chemical-sensors** and **bio-sensors** for field analysis.

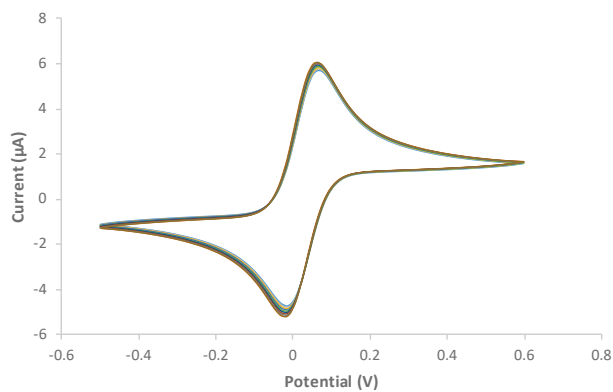


» Thick-film carbon electrodes performance

» PRECISION INTRA-ELECTRODE

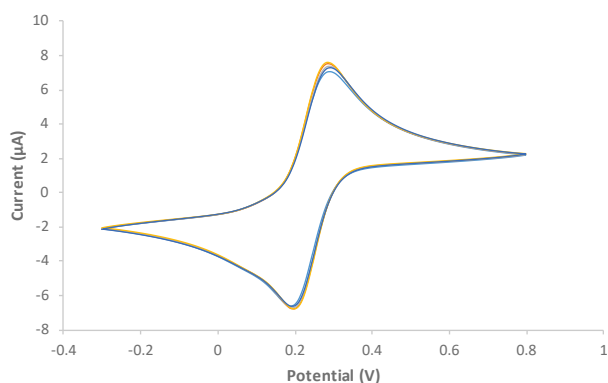


Successive cyclic voltammograms for 1 mM $K_4Fe(CN)_6$ in 0.1 M H_2SO_4 at the **same** thick-film carbon electrode (ED-51PE-C). $v = 50$ mV/s, $n = 10$, **RSD = 2%**

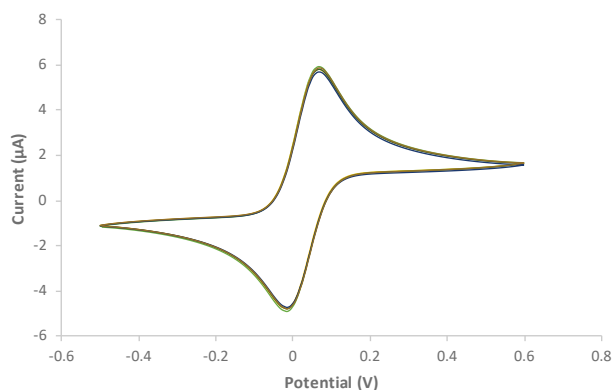


Successive cyclic voltammograms for 1 mM ferrocene methanol in 0.1 M H_2SO_4 at the **same** thick-film carbon electrode (ED-51PE-C). $v = 50$ mV/s, $n = 10$, **RSD = 2%**

» PRECISION INTER-ELECTRODE

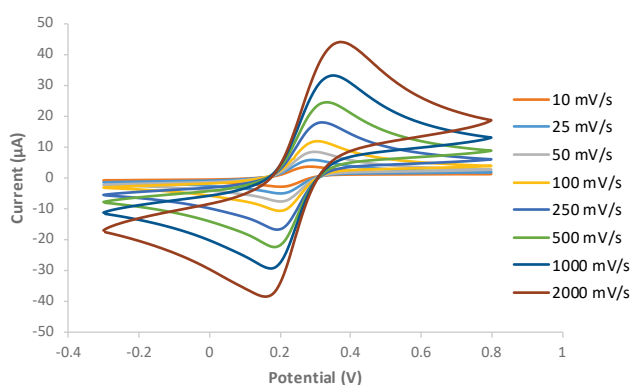


Cyclic voltammograms for 1 mM $K_4Fe(CN)_6$ in 0.1 M H_2SO_4 at **different** thick-film carbon electrodes (ED-51PE-C). $v = 50$ mV/s, $n = 5$, **RSD = 3%**

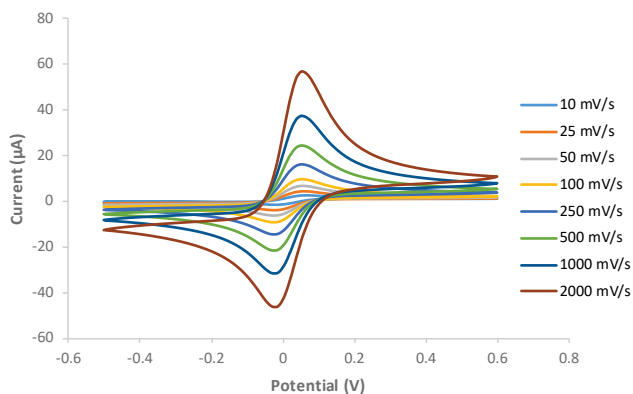


Cyclic voltammograms for 1 mM ferrocene methanol in 0.1 M H_2SO_4 at **different** thick-film carbon electrodes (ED-51PE-C). $v = 50$ mV/s, $n = 5$, **RSD = 2%**

» SWEEP RATE



Cyclic voltammograms for 1 mM $K_4Fe(CN)_6$ in 0.1 M H_2SO_4 using different **scan rates** at a thick-film carbon electrode.



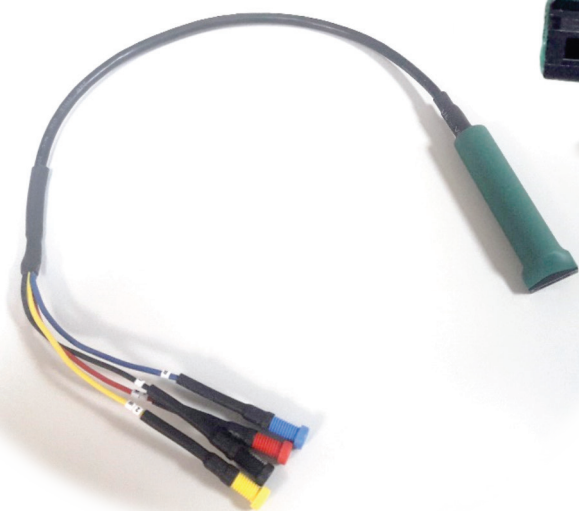
Cyclic voltammograms for 1 mM ferrocene methanol in 0.1 M H_2SO_4 using different **scan rates** at a thick-film carbon electrode.



» Thick-film electrodes related accessories

Different **connectors** for interfacing the printed electrodes with any commercial potentiostat are also available at MicruX.

» CABLE connector (ED-SPE-CABLE)



The **CABLE connector** (*Ref. ED-SPE-CABLE*) provides an interface between the electrodes (up to four contact pads) with the potentiostat, enabling the use of microvolume (20 – 50 μ L sample drops) or dipping into a solution. The cable ends are available with **2 mm female or male bananas**.

Dimensions: 50 cm long

» BOX Connector (ED-SPE-BOX)



The small **BOX connector** (*Ref. ED-SPE-BOX*) provides an interface between the electrodes (up to four contact pads) with any kind of potentiostat, enabling the use of microvolume (20 – 50 μ L sample drops). The interface ends are available with **2 mm female bananas**.

Dimensions: L58 x W40 x H15 mm



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