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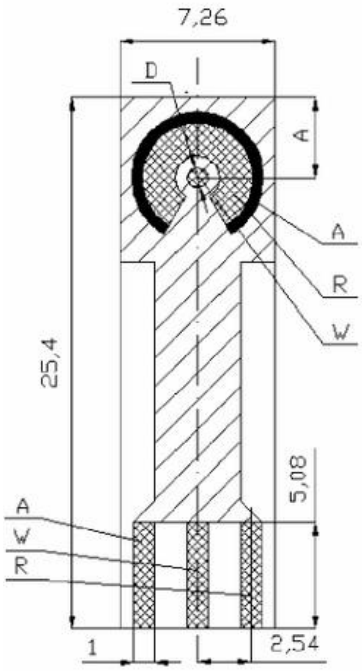
ELECTROCHEMICAL SENSOR WITH A WORKING ELECTRODE OF GUARANTEED PURITY

Type: AC1.GP.W*.A*.R* (*)

DESCRIPTION

Substrate material	corundum ceramic
CE material	Au + Pt alloy, Au, Pt, Ag, carbon* (graphite)
WE material	gold, platinum, silver, copper, iron, nickel, cobalt, chromium, tantalum, irridium, rhenium, magnesium, palladium, zirconium and others*
WE layer thickness and metal purity	standard layer thickness is 0.0125 mm, purity is guaranteed of up to 99.99 % according to selected metal material* by customer
Amounts of WEs	1
RE material	Ag, Ag-AgCl (65% Ag + 35% AgCl in polymeric binder), Ag covered by AgCl electrolytically
Final dielectric protection layer	ceramic, polymeric
Electrode system	CE + RE + WE
Ø of the disc WE	2.00 ± 0.05 mm
WE geometric area	3.14 ± 0.1 mm^2
Surface modification	blank
Possible applications	detection of redox active species, electrolysis, modification with biomolecules



PHYSICAL PARAMETERS

Weight:	0.90	g	**Width:**	7.26	mm
Length:	50.80	mm	**Thickness:**	0.63	mm

TOPOLOGY

Electrode materials are defined by: **AC1.GP.W*.A*.R* (*)**
The aterisk is replaced by appropriate number or letter.

AC1 – sensor group reference number

W – working electrode material (standard layer thickness 0.0125 mm, guaranteed purity up to 99.99% depending on the selected material) *	**R** – reference electrode material
gold, platinum, silver, copper, iron, nickel, cobalt, chromium, tantalum, irridium, rhenium, magnesium, palladium, zirconium and others	**S** – silver
A – auxiliary electrode material	**1** - 65% Ag + 35% AgCl (in polymeric binder)
S - alloy of gold and platinum	**2** - Ag covered by AgCl electrolytically
1 – pure gold	**(*)** – additional technical specification
2 – pure platinum	H, Pt1000, T – sensor sensing elements
3 – pure silver	MAC – integrated microreactor
4 – carbon (graphite)	Hydrophobic ring on WE

**Selection of sensor electrode materials other than those listed above is possible upon agreement with the customer.*

RECCOMENDED ACCESORIES

Connector for electrochemical sensor

Connector KA1.*	https://bvt.cz/produkt/ka1/
Connector KA1.C.*	https://bvt.cz/produkt/ka1-c/
Connector KA1.S.*	https://bvt.cz/produkt/ka1-s/

EVALUATION UNITS

Recommended potentiostats

PalmSens	https://bvt.cz/kategorie-produktu/potentiostats/palmsens-potentiostats/
BVT	https://bvt.cz/produkt/gx102-potentiostat/
eDAQ	https://bvt.cz/kategorie-produktu/potentiostats/edaq-potentiostats/

MATERIAL RESISTANCE

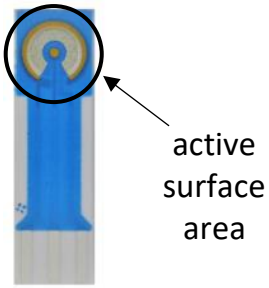
Sensor is (in final step of production) covered by a polymeric or ceramic dielectric protection layer.
Please note, polymeric dielectric protection layer (and also polymeric binder in graphite paste) has limited resistance to organic solvents.
Ceramic protection layer has limited resistance to strong acids.

Sensors can be dried in an oven up to 150 °C (max. 2 hours) or left to dry freely.

For detailed information see: https://bvt.cz/wp-content/uploads/2024/01/AC1.-senzory-materials-handling-letak-V.6-aktualizace-2023.pdf

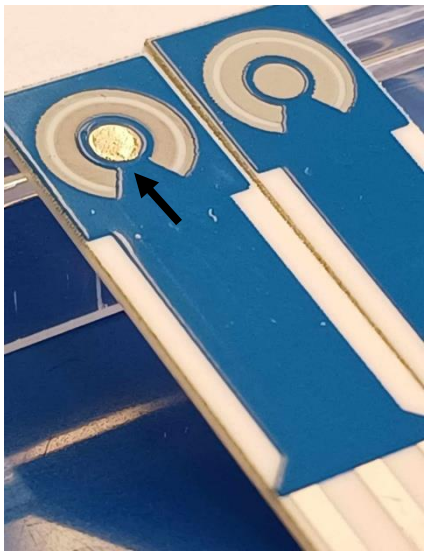
HANDLING

The active surface of the sensor should not be wiped mechanically or with a cloth with an organic solvent.
The active surfaces of the sensor should not be touched by fingers during handling.



STORAGE

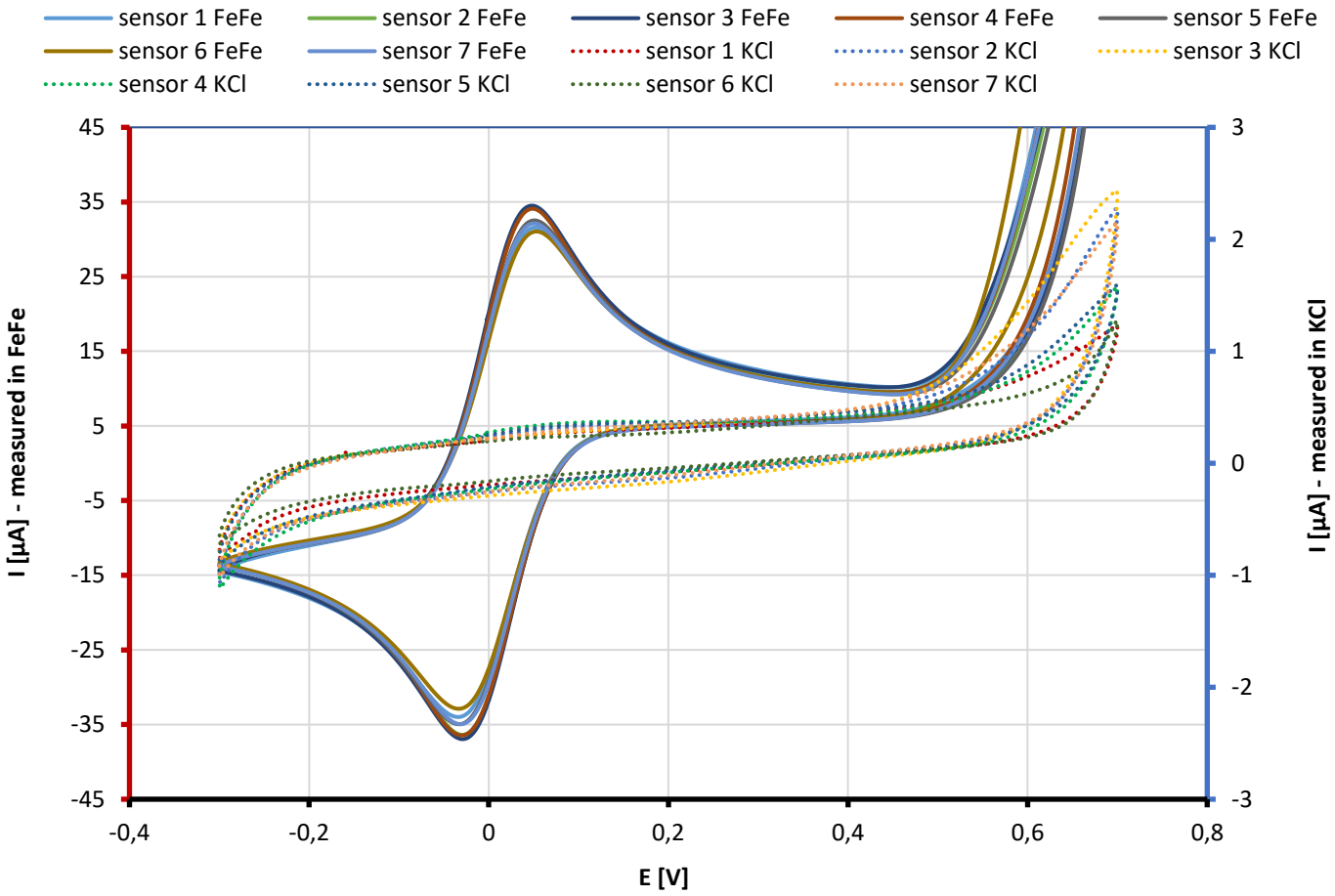
Sensors should be stored in a closed box with silica gel away from light.



On the left sensor with WE with pure Platinum with a guaranteed purity of 99.95%, on the right for comparison sensor with WE with ordinary platinum paste.

EXAMPLE OF MEASUREMENT

Response of 7 pcs of AC1.GP sensors with working electrode from pure platinum (purity 99.95%)



Measurement specification

Cyclic voltammetry (3 scanns – 3rd scans are used for graph), scan rate: 50 mV/s, potential range: -0,3 to +0,7 V
Temperature: 20 °C

Used equipment

Potentiostat eDAQ, electrochemical glass cell TC6, stand for TC*, connector KA1.C.*

Sensor AC1.GP.W-Pt 99.95 %.A2.RS

Used chemicals

FeFe: 0.005M $K_3[Fe(CN)_6]$ + 0.005M $K_4[Fe(CN)_6]$ in 0.2M KOH

RELATED LITERATURE

Patents

- US20080169191A1 (Nanostructured Working Electrode of an Electrochemical Sensor, Method of Manufacturing Thereof and Sensor Containing This Working Electrode)
- CZ2005294A3

ORDERING INFORMATION

The order is specified by whole sensor description formula.
Minimum order quantity – **100** sensors (= 5 boxes per 20 pcs).
All order quantities are to be in multiples of 20 e.g. 100, 120, 140, 160, etc.

Example of order

100 pcs – AC1.GP.W-Pt 99.95%.A2.RS

DELIVERY TIME

Delivery time for standard AC1.GP sensors is a maximum 8 weeks from receipt of order.
Delivery time for non-standard AC1.GP sensors depend on final technical specification of order.