

## Acetylcholinesterase BIOSENSOR

Type: AC1.AChE

### Description

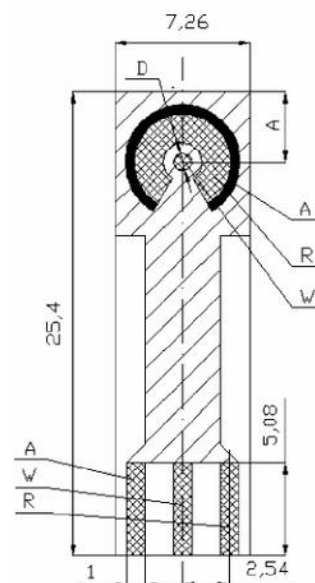
Acetylcholinesterase from electric eel type VI-S is immobilized on the active surface of a working electrode of electrochemical sensor AC1.W2.RS (i.e. Platinum working electrode, silver reference electrode). The diameter of the immobilized bioactive membrane is 2 mm and the mean applied activity is 1 unit/mm<sup>2</sup>.

### Physical parameters

#### Dimensions:

Weight: 0.4 gms  
Length: 25.40 mm  
Width: 7.26 mm  
Thickness: 0.63 mm

A = 4.00 mm  
D<sub>w</sub> = 1.00 mm



**Electrode Materials** are defined by:

AC1.W2.RS

W... Working electrode - pure platinum

R ... Reference electrode - silver

(Detailed description of sensor: datasheet AC1.W\*.R\* (\*))

Enzymatic membrane containing cca 1 IU of AChE enzyme is immobilized on the working electrode surface.

### Unit definition - Acetylcholinesterase from electric eel

- AChE
- True cholinesterase
- EC 3.1.1.7
- Sigma Aldrich - type VI-S
- One unit will hydrolyze 1.0 µmol of acetylcholine to choline and acetate per minute at pH 8 and temperature 37 °C.

### Connector types for AC1.AChE sensors range

	KA1	KA1.S	KA1.C	KA4
AC1.AChE	✓	✓	✓	✓

Datasheet: AC1.AChE

## Evaluation Unit

- PalmSense

## Sensor Usage

Measurement of AChE inhibitor concentration - especially organophosphorous and carbamate pesticides (paraoxon, malaoxon), toxic and neurotoxic gases (sarin, soman, tabun, VX).

## Expiration

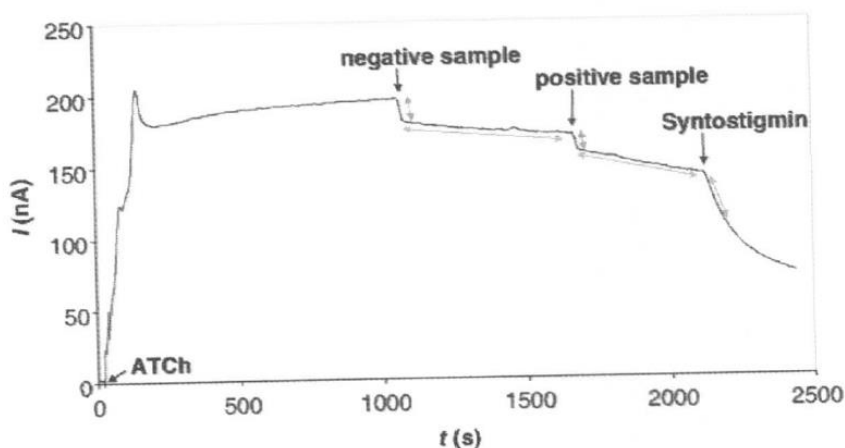
3 months at temperature 4 - 7°C (fridge)

## Storage

- Before use, store the sensors in a dry state in the fridge in the original box with silica gel.
- Once the sensors have been used in liquid solutions, they must not be allowed to dry out (the active membrane of the biosensor swells in the liquid and its subsequent drying can damage the sensor)!
- When reusing AChE sensors after measurement, it is possible to store them, for example, in a test tube with a 0.01 M PBS buffer of pH 7.2 or in a physiological solution - bacterial contamination can be prevented by adding sodium azide to the storage solution (content 0.05%).

## Measurement

- Measuring method amperometry at applied potential +350 mV.
- Acetylthiocholine is used as an AChE enzyme substrate and Syntostigmine (neostigmine) as an enzyme inhibitor standard.
- Measuring principle - the decrease of AChE enzyme activity is proportional to the inhibitor concentration - see graph below (more information can be found in publications [1, 2]).



### **Transport**

- Sensors are delivered in thermoboxes keeping low temperature when ambient temperature may exceed 40 degrees Celsius.

### **Ordering information**

- The order reference: AC1.AChE
- Minimum order quantity - 20 sensors
- Orders in multiples of 20
- Delivery time for standard AC1.AChE sensors is 4 weeks from receipt of order
- Delivery time for non-standard AC1.AChE sensors depends on final technical specification of order

### **Examples of Order**

- 100 pieces - AC1.AChE

### **References**

[1] Z. Grosmanová, J. Krejčí, J. Týnek, P. Cuhra, S. Baršová: Comparison of biosensoric and chromatographic methods for the detection of pesticides. International Journal of Environmental Analytical Chemistry 85(2005) 885-893

[2] J. Haze, M. Skocdopole, J. Krejci, R. Vrba, L. Fajcik, D. Krejcova, Z. Grosmanova: Artificial synapsis - The detector of pesticide toxicity. XVII IMEKO World Congress Metrology (2003)