



Animals & Plants Measure CO₂ Dynamics

Dear Max Mustermann

You are looking for a matching tool for low CO₂ measurements in small volumes? Or do you need to measure - in high spatial resolution - CO₂ dynamics in animals or plants? You should then have a closer look on our application examples, the different CO₂ microsensors ([implantable](#) and [needle-type](#)) and the [CO₂-1 ST](#) meter by PreSens, which will offer the perfect support for your application.

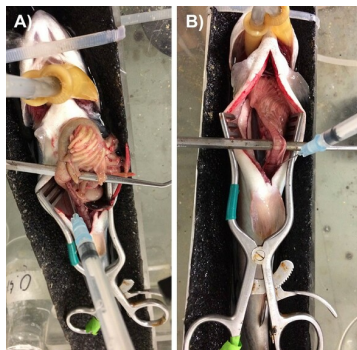
And once you are ready to discuss your CO₂ set-up with our expert, please do not hesitate and contact [Dr. Martin Gutbrod](#).

We are looking forward to hearing from you!

Your PreSens Team

Direct Measurement of pCO₂ in the Digestive Tract of Fish

Use of fiber optic pCO₂ microsensors to reliably measure *in vivo* pCO₂ in various sections of the gastrointestinal system in several fish species



The objective was to measure the pCO₂ levels in the fluids of the stomach and various sections of the intestine in both fasted and fed fish. It was essential that these measurements be made without rupturing the tract, so as to prevent equilibration with the ambient media. Conventional pCO₂ electrodes are simply too large to insert into the tract without severely damaging it. Needle-mounted PreSens fiber optic pCO₂ microsensors proved to be ideal for this purpose, as the needle could be inserted through the wall of the tract directly into the desired location, allowing sequential monitoring of pCO₂ in various sections of the gut.

>> [Read the entire application note ...](#)

The following products were used:

- [Needle-type CO₂ Microsensor NTH-CDM1](#)
- [Implantable CO₂ Microsensor IMP-CDM1](#)

and ...

- For use with microsensors & dipping probes type CDM1
- Controlled with PreSens Measurement Studio 2
- Compensation of temperature & pressure
- Lightweight (only 296 g)
- USB-powered & small outer dimensions

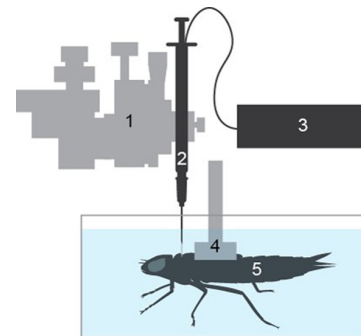
Dimensions



In vivo Monitoring of Haemolymph pCO₂ in Dragonfly Nymphs to Determine the Resting State Value

Use of fiber optic pCO₂ Microsensors to reliably measure *in vivo* haemolymph pCO₂ in insects

The objective of this study was to monitor the haemolymph pCO₂ of water-breathing dragonfly nymphs *in vivo*. However, the small body size and haemolymph volume of these animals prohibited the use of standard *in vitro* measurement techniques and pCO₂ electrodes. To overcome these issues, 250 µm diameter PreSens fiber optic pCO₂ microsensors were used, which could be implanted directly into the insect's haemocoel, providing continuous real-time monitoring of haemolymph pCO₂. In combination with video monitoring of abdominal ventilation frequency, test results show that the haemolymph pCO₂ of a resting dragonfly nymph fluctuates between 1 to 1.5 %, varying inversely with ventilation rate.



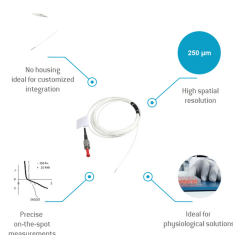
>> [Read the entire application note ...](#)

The following products were used:

- [CO2-1 ST](#)
- [Needle-type CO2 Microsensor NTH-CDM1](#)

and ...

Implantable CO₂ Microsensor IMP-CDM1



- The bare glass fiber tip can be mounted to your own housing, steel tubes, catheters, etc.
- CO₂ measurements in liquids (0.04 to 5 % CO₂)
- High spatial resolution (250 µm)
- Not influenced by electromagnetic fields

O₂, pH and CO₂ Dynamics in Salt Marsh Tidal Ponds

Investigations under different light regimes with optical profiling microsensors and an automated micromanipulator



Salt marsh ponds are extreme environments characterized by high microbial activity and strong biogeochemical gradients at the sediment-water interface. In this study, the O₂, pH and CO₂ dynamics in the top sediment layer of marsh ponds under different light regimes were investigated. Using the Automated Microprofiling System from PreSens profiling of O₂, pH and CO₂ was conducted on marsh pond sediment cores in a growth chamber under light exposure. The oxygen penetration depth increased from 1 mm in darkness to 2 - 6 mm in light. At the sediment-water interface, photosynthetic activity by benthic microalgae and other photoautotrophs resulted in supersaturated oxygen conditions in light. In contrast, pH and CO₂ at the sediment surface was unaffected by the varying light conditions and high photosynthetic activity suggesting a high buffering capacity of the pond water and sediment.

>> [Read the entire application note ...](#)

The following CO₂ products are suitable:

- [CO2-1 ST](#)

and ...

Needle-type CO₂ Microsensor NTH-CDM1



- Designed for measuring in small volumes
- CO₂ measurements in liquids (0.04 to 5 % CO₂)
- High spatial resolution (250 µm)
- Ideal for physiological solutions
- Precise on-the-spot measurement

You would like to learn even more about PreSens Precision Sensing? Please visit our homepage www.presens.de and don't hesitate to contact us. Any feedback will be appreciated.

With kind regards

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