

+++++++ NEW PRODUCT ++++++



Product Information

Accantix

SURFACE IMAGING SYSTEMS

Cantilever based sensor for detection of biochemical reactions

Accantix allows the easy and convenient detection of biochemical reactions.

At least two cantilevers are placed in the gas/liquid cell, one with a reactive coating, one without. If some biochemical reaction takes place between the gas/solution in the cell and the reactive coating a deflection of the cantilever will be the result. The second non coated cantilever is used as a reference to compensate deflection of both cantilevers e.g. due to external perturbations.

Up to eight cantilevers in one Accantix cell are possible; only one of them is needed as a reference. Therefore you can measure up to seven channels.

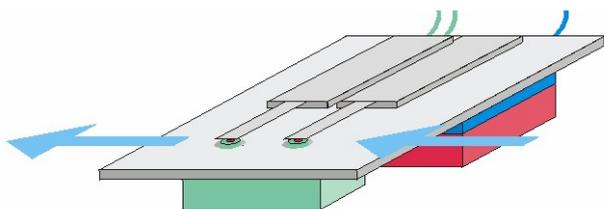
The cantilevers may be independent from each other (single cantilever chips) which allows for easier cantilever preparation, or may be part of one chip (e.g. 2 cantilevers per chip are available).

Even standard Scanning Probe Microscope levers may be used (Si, or SiN4 type resp.).

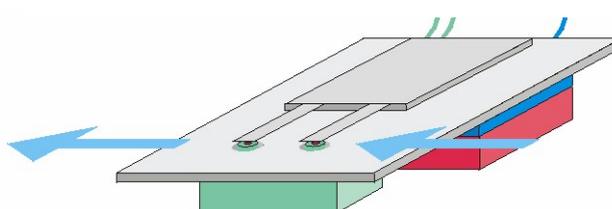
The Accantix® cell can be used for experiments in gaseous atmospheres or in liquids. It is made of PTFE and stainless steel. Other materials are available upon request.



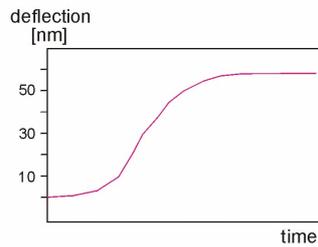
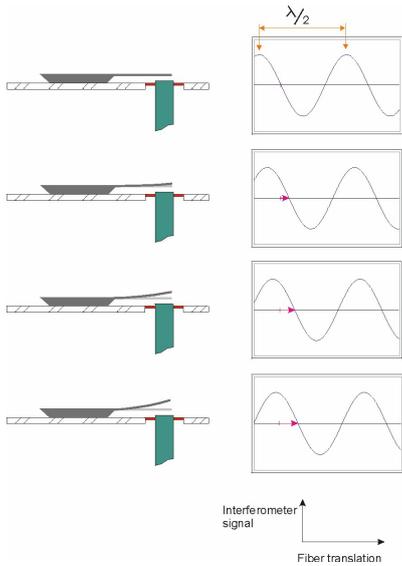
Accantix controller, Accantix liquid cell and computer
Inset: Detail of Accantix liquid cell



Set up example: two separate cantilevers



Set up example: two cantilevers on one chip



Detection principle

The cantilever is mounted close to an optical fiber. Its distance to the fiber end is measured interferometrically (patent pending). A deflection of the cantilever can be detected via a change of the interference pattern.

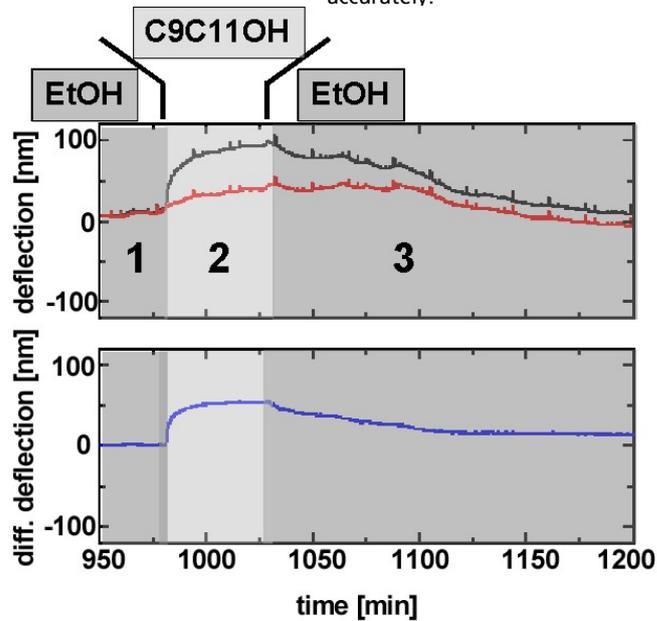
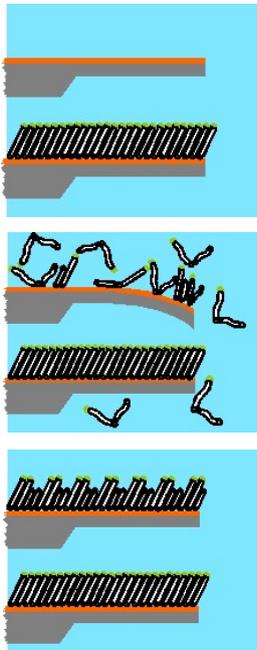
The deflection of the cantilever can have several reasons, for example:

a) if the Si-cantilever has a metal coating a temperature change will result in a bending of the cantilever. This is caused by the different coefficient of expansion.

b) if the Si-cantilever has a reactive bio molecular coating: If a solution contains molecules which react with the coating a chemical reaction will take place and cross linking of the new functional groups can occur.

When a liquid is filled into the liquid cell the refractive index is changed. This will result in a change of the detected wavelength. Therefore the refractive index can be also measured very accurately.

A deflection of the cantilever will result in a phase shift of the interferometer signal.



Monitoring C9C11OH ($\text{CH}_3 - (\text{CH}_2)_9 - \text{S} - \text{S} - (\text{CH}_2)_{11} - \text{OH}$) self-assembly on a cantilever

Microcantilever sensors (MCs): dialkyldisulfide formation and behaviour in water-alcohol solutions

Data and graphics courtesy Dr. Rüdiger Berger et al., MPI for Polymer Research, Mainz, Germany

black: reference cantilever: $\text{HO} - (\text{CH}_2)_{11} - \text{SH}$ SAM on gold

red: target cantilever: bare gold

EtOH = Ethanol

Specifications of the Accantix-System

Principle:	Interferometric detection, no calibration required
Resolution:	< 0.01 nm (interferometric system)
Number of cantilevers:	2 (basic system) up to 10 possible
Detectable Δn :	< 1×10^{-3}
Modi:	Static, Dynamic
Operating system:	MS Windows
Temperature stabilized ± 0.01 °C, range up to 80°C	