



MICRORING SENSORS

Compact optical multisensor for disposable bioanalytics are designed for fast, cost-effective and specific measurement of a wide range of chemical and biological substances.

A novel analysis method based on photonic integrated microring resonators made of silicon nitride (SiN) is used. Nucleic acid-based capture molecules (aptamers), are specified in order to be used in the fields of diagnostics, life science, environmental analysis, and food analysis.

Point-of care disposable

In the field of sensor technology, time and costs have become important factors.

Compact optical analysis devices are designed to meet these requirements and enable fast, cost-efficient and specific measurement of a wide range of chemical and biological substances.

The combination of SiN based ring resonators, functionalized with nucleic acid-based capture molecules (aptamers) can meet precisely these requirements.

Proof of this is to be provided in this development project. Two fields of application will be defined and demonstrators built for them.

Technical Informations

- Integrated photonic microring resonators
- Based on silicon nitride (SiN) wafer technology
- Functionalized by aptamers (Nucleic acid-based capture molecules)
- Rapid measurements (seconds)
- High resolution quantitative results

Applications

- Environmental analysis
- Food industry
- POCT
- Companion Diagnostics (CDx)

APPLICATIONS



Water analytics

Problem:

The detection of bacteria and viruses in water is an important part of ensuring general health. For example, analyzing the water in wastewater treatment plants should provide information about possible sources of Covid-19 infection. The faster and more precise the desired result is available, the more accurate the consequences can be.

Solution:

Direct on-site measurement of the substance in question brings enormous time and economic benefits, as there is no need to go to a laboratory. Compared to current rapid tests based on color change, the aptamers used increase accuracy and sensitivity.

Further applications:

- Cyanobacteria
- SARS-CoV-2
- Legionella

Markets: Environmental analysis. Food industry



Individual healthcare

Problem:

The lifestyle and life science market in Germany is growing steadily. Cost-effective, mobile and networked measuring devices are desirable, especially due to digital networking and the desire to be able to analyze as many body parameters as possible, anytime and anywhere.

Solution:

The ring resonators used in this project, functionalized with aptamers, enable fast and reliable measurement of the target in question. In combination with a WiFi-capable measuring device, the requirements of this social media-driven market will be met.

Further applications:

- Vitamin D
- Ferritin
- Vitamin B12

Markets: Life science market, food industry (supplement industry), POCT (point of care testing)

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