

TECH OFFER

## Molecular Imprinted Polymers (MIPs) based Fluid Sensors for Contaminants Monitoring



### KEY INFORMATION

TECHNOLOGY CATEGORY:

Environment, Clean Air & Water - Sensor, Network,  
Monitoring & Quality Control Systems  
Foods - Quality & Safety

TECHNOLOGY READINESS LEVEL (TRL): **TRL7**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO174855**

### OVERVIEW

Monitoring of contaminants in fluids often require capital-intensive machinery and sampling comes at a hefty price tag. With the advent of tightening regulations across various industries including environmental and food industries, there is a need for a more cost-effective and efficient method to meet the growing demands and regulatory requirements in the market. Molecular Imprinted Polymers or MIPs are one such sensor technology that can potentially address this challenge.

MIPs are synthetic materials that are **designed to recognize and selectively bind to specific molecules, similar to the way antibodies recognize and bind to antigens**. MIPs can be engineered to bind to a wide range of analytes, including organic and inorganic molecules, peptides, proteins, and even whole cells. The unique feature of MIPs is that they possess high selectivity and sensitivity for the target molecules, making them ideal candidates for designing high-performance sensors.

This technology relates to a cost-effective online monitoring system using MIPs technology to **detect trace levels of chemical and**

**biological contaminants on-site in the fluid phase with low interference, high accuracy, and sensitivity.** The automated real-time monitoring system requires little supervision and can be easily operated. The robust sensor is designed for long-term operation and requires minimum maintenance without compromising the reproducibility and integrity of the data. This technology allows monitoring can be applied in industries such as agriculture, food, chemical processes, environment monitoring and waste management.

The technology provider is seeking partners that are interested in **co-development, R&D collaborations or licensing.**

## TECHNOLOGY FEATURES & SPECIFICATIONS

This technology is primarily based on the mass change and energy dissipation from the analyte adsorptions and interactions on the sensor chip, which gives a piezoelectric effect and delivers real-time, high sensitivity, and high selectivity data. The entire sampling and analysing process is automated. Key features include:

- **Shortened analysis time (<10 mins) compared to conventional sensors (30 - 45 mins)**
- **High accuracy, and sensitivity (ppb level detection)**
- Real-time and online monitoring
- Label-free, non-toxic, and environmentally friendly sensing process
- Regenerable sensor chips
- Modular designs
- Automated system

## POTENTIAL APPLICATIONS

- Heavy metal detection
- Pesticide residue detection
- Endotoxin detection
- Wastewater treatment and resource recovery
- Water quality monitoring in water bodies

## MARKET TRENDS & OPPORTUNITIES

The manufacturing process and water monitoring regulations are becoming increasingly stringent. The global water quality monitoring market has a CAGR of 6.5% from 2020 to 2027, showing the potential commercial gains from such sensors. As more and more substances are required to be monitored, users can find convenience and cost savings from having a sensor that is able to detect multiple target molecules.

## UNIQUE VALUE PROPOSITION

- Proprietary algorithm to overcome interferences
- Cost-effective (per sample basis: **5 SGD vs. 15- 25 SGD**)