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Technology Overview

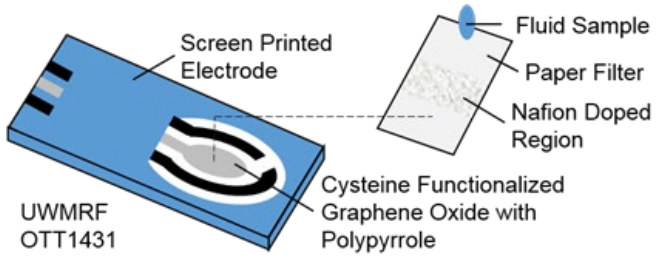
Portable Sensor for Heavy Metal and Water Quality Monitoring
OTT1431

Applications
Water quality monitoring, environmental testing, industrial wastewater analysis, and heavy metal sensing.

Target Problems
Current methods for detecting heavy metal contamination often require expensive laboratory instrumentation, trained operators, complex sample preparation, and significant operating costs. These limitations make routine, on-site monitoring difficult and costly.

Solution
UWM researchers have developed a portable, low-cost sensor for ultra-sensitive heavy metal detection and pH measurement. Compared with conventional laboratory instruments, the technology is simpler to use, requires less sample volume, and opens the possibility of conducting water-quality testing directly in the field rather than relying exclusively on laboratory analysis. The platform can detect multiple metals in a single test, making it well suited for water quality monitoring, environmental testing, and industrial applications.

Key Benefits
- Detects lead levels as low as 0.07 ppb
- Measures heavy metals and pH simultaneously
- Portable, calibration-free operation
- Requires less than 10 µL sample volume
- Stable for repeated use
- Highly reproducible results
- Detects multiple metals in a single test



About this Technology
This technology uses a novel nanocomposite electrode to provide highly sensitive heavy metal detection and independent pH measurement. By accounting for pH effects, the sensor delivers accurate results across a range of sample conditions. Its high sensitivity, stability, and ability to detect multiple metals make it well suited for water quality monitoring, environmental testing, and industrial applications.

Stage of Development
Patented technology with demonstrated heavy metal and pH sensing capabilities.

Partnering Opportunity
The inventors have also launched a startup, Septillionth, to further develop and bring this technology to real-world use. Additional research and development opportunities are available to expand detection capabilities to additional metal contaminants and sensing applications.

Intellectual Property (IP)
Issued Patents, United States: 10,684,249, Canada: 2,968,888, and Mexico: 386477. Protected and managed by the UWM Research Foundation.

Lead Inventor
- **Woo-Jin Chang,** UWM Associate Professor, Mechanical Engineering

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