



## Disposable, Digital Phosphate Sensor

OTT ID - 1513

### APPLICATION

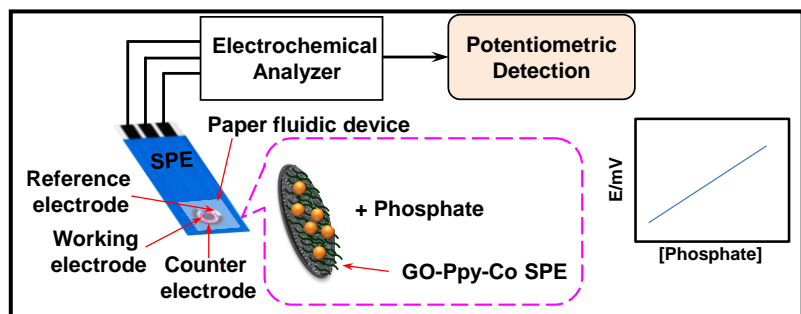
Drinking water treatments, Waste water treatments, Aquaculture operations, Aquariums, Analytical and Pharmaceutical laboratories, Fertilizers industry etc.,

### TARGET PROBLEMS

- ❖ Increased levels of phosphate can lead to eutrophication, low oxygen in waterways that can severely affect aquatic life, and toxic algal blooms.
- ❖ The EPA approved method for measuring phosphates involves the use of chemical reagents.
- ❖ In some cases, samples must be brought back to the lab for analysis.

### TECHNOLOGY

Inventors at UW-Milwaukee (UWM) have developed a highly sensitive, digital, graphene based electrochemical sensor for the detection of phosphate in water. The sensor is designed to detect phosphate levels as low as  $10^{-10}$  M (mol/L) using layers of graphene oxide, polypyrrole and metal. It is specific and can avoid interference from potassium chloride present in the solution.



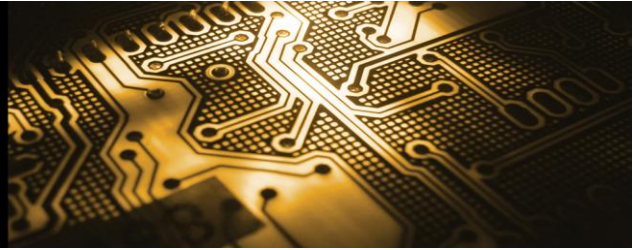
Phosphate is a well-known contaminant of water which in excess leads to eutrophication, or an excess of nutrients in the water. The UWM phosphate sensor is easier to use and more sensitive compared to other reported devices, many of which focus on a colorimetric assay. It uses a simple digital potential readout through a voltmeter rather than voltammetric stripping. The system can be hand held for mobility or mounted as a semi-permanent device. Positive test results have shown that, this device can provide an accurate and inexpensive alternative to the current products on the market.

### FEATURES AND BENEFITS

- ❖ **Highly Sensitive** – Detects phosphate levels as low as  $10^{-10}$  M (mol/L), several orders of magnitude lower than other devices.
- ❖ **Low Cost** – The material used are readily available and only a voltmeter is needed for detection
- ❖ **Disposable and Easy-to-Use**– Sensors can be fabricated for one time use for quick and easy set-up. Can be hand held or mounted.
- ❖ **Pre-Calibrated and Quick** – Sensors can be supplied pre-calibrated that can save time.
- ❖ **Multiple Applications** – Residential, industrial, environmental, governmental and research use.



# Technology Overview



## INTELLECTUAL PROPERTY

PCT Filed Oct. 2018, [PCT/US2018/046322](#)

This technology is part of an active and ongoing research program at UWM and is available for developmental research support and/or licensing under non-exclusive terms.

## INVENTOR(S)

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