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## Cloud- enabled Wireless pH Monitoring in Laboratory Sample Vials

Tech ID: 30231 / UC Case 2019-383-0

### BRIEF DESCRIPTION

A team of inventors at UCI have developed a miniaturized, wireless pH sensing system capable of monitoring the pH of laboratory samples in real-time with cloud-enabled connections for data collection. The sensor is designed to fit into the caps of standard sample vials, providing continuous measurements and eliminating the need to open vials during sensing.

### FULL DESCRIPTION

Monitoring pH levels of different solutions and samples is a standard practice in many chemical, biological and engineering laboratories. Traditional methods use bulky and expensive glass style dual junction pH probes that require opening sample containers to insert the sensor and take a pH measurement. As a result, solutions are exposed to oxygen during the process and have the potential to affect measurements. Additionally, monitoring multiple solutions at a time is time-consuming and laborious which can impact efficiency of daily experiments.

Investigators at UCI have identified a unique solution to these problems by creating an integrated pH sensor with a myriad of capabilities. They have developed flexible, miniaturized, Iridium Oxide-based electrodes with passive wireless power and communication integration. This integrated sensor is fitted inside of reusable standard sample container caps so that it can be easily screwed onto sample vials. This design enables measurements to be taken continuously and in real-time without interference of ambient environment conditions. Furthermore, this system will be able to monitor multiple samples at the same time and send data to the cloud for ease of collection. Clearly, a once time-consuming task has now turned into a simple, sensitive, and efficient system for laboratory

users.

### SUGGESTED USES

- Simultaneous pH monitoring of multiple of samples
- Can be used in a variety of laboratory environments
- Integration into standard laboratory equipment

### FEATURES/BENEFITS

- Real-time sensing
- Eliminate need for opening of sample containers during measurement
- Miniaturized, flexible sensor to remove bulkiness of previous sensors
- Use of inexpensive, but high-performance, sensitive electrode materials

### CONTACT

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### INVENTORS

- » Cao, Hung

### OTHER INFORMATION

### CATEGORIZED AS

- » **Communications**
  - » Wireless
- » **Computer**
  - » Hardware
  - » Software
- » **Sensors & Instrumentation**
  - » Biosensors
  - » Scientific/Research

### RELATED CASES

2019-383-0

- Wireless power and communication capabilities
- Simplify data collection with cloud-enabled connections

## PATENT STATUS

Patent Pending

## STATE OF DEVELOPMENT

Currently, a working prototype of integrated sensor with signal detection capabilities has been demonstrated. Future plans include integrating cap with sensor, design of a base station sample array, design of software user interface, and integrating off site data transmission ("cloud connection").

## ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ Flexible, Biocompatible Microfluidics-inspired Micro-reference Electrodes for Sensing Applications
- ▶ At Home Fetal Electrocardiogram/Heartrate Monitor for Congenital Heart Defect Diagnosis
- ▶ Unobtrusive Fetal Heartrate Monitoring In The Daily Life

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