Smartphone-Based Device for Monitoring Chemical Pollutants in Water

**Track Code:** 2017-NNAN-67970

**Categories:**
- Biotechnology
- Computer Technology

**Keywords:**
- Biotechnology
- Clean Water
- Computer Technology
- Drinking Water
- Smartphones
- Water
- Water Testing

Enhanced frequency in monitoring water-borne pollutants is important to curbing inadvertent consumption of contaminated water. Conventional analytical instruments, such as atomic absorption fluorescent spectrometer and inductively coupled plasma mass spectrometer, are not amenable for such frequent monitoring needs given the high cost to purchase and maintain, require highly-trained personnel, and delicate sample handling and transportation. There is need for an inexpensive method for on-site monitoring of water-borne pollutants more easily.

Researchers at Purdue University have developed a smartphone-based device for monitoring target contaminants in water samples. Water containing target ions react with specific colorimetric reagent, yielding colorimetric analytes, which vary in intensity as the concentration of the target ion changes. This technology puts into consideration, the complete and composite undulations in the image properties of the analyte under investigation. This relationship formed the basis for the development of an algorithm utilized in the smartphone based monitoring device with the capability of recalibration in the event of a change in device or lighting condition. The ease of operation, ubiquity, robust algorithm, cost effectiveness, and novel approach in this technology is noteworthy, especially with the fast assay time.

**Advantages:**
- Uses a smartphone
- User friendly
- Cost effective
- Widely available
- Easy to operate
- Fast results

Potential Applications:

- Industries that deal with pollutants
- Wastewater Treatment Plants
- Drinking Water Treatment Plants
- Municipalities,
- State and Federal Environmental Protection Agencies
- World Health Organization

People:

- Nnanna, Agbai (George) (Project leader)
- Ndukaife, Justus C
- Ozeh, Samuel

Intellectual Property:

- **Application Date**: February 20, 2019
  - **Type**: Utility Patent
  - **Country of Filing**: United States
  - **Patent Number**: (None)
  - **Issue Date**: (None)

- **Application Date**: February 19, 2019
  - **Type**: PCT-Patent
  - **Country of Filing**: WO
  - **Patent Number**: (None)
  - **Issue Date**: (None)

- **Application Date**: February 20, 2018
  - **Type**: Provisional-Patent
  - **Country of Filing**: United States
  - **Patent Number**: (None)
  - **Issue Date**: (None)

Contact OTC:

Purdue Office of Technology Commercialization
1801 Newman Road
West Lafayette, IN 47906

Phone: (765) 588-3475
Fax: (765) 463-3486
Email: otcip@prf.org