



Wireless Networked Sensors in Water for Heavy Metal Detection

158 Wheatland Dr.
Pembroke, VA 24136

Contract Number: DE-SC0013811
NanoSonic, Inc.
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Impact:

RCRA 8 heavy metals - arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver - have attracted a great deal of attention for their impact on environmental pollution and human health.

NanoSonic's practical and reliable wireless networked chemical sensors offer **high selectivity and high sensitivity as low as 0.01 ppm**, for the detection and mapping of RCRA 8 heavy metal contaminants in water, for use within power generation facilities.

Broad Range Applications:

- Water quality monitoring
 - Industrial
 - Environmental
- Waste site chemical monitoring
- Biochemical sensors



IP and Awards:

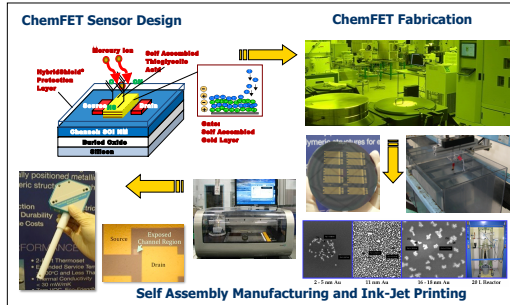
- NanoSonic has exclusively licensed nine patents covering electrostatic self-assembly (ESA) processing and use from Virginia Tech and is establishing its own intellectual property portfolio to enable process, material, and device commercialization
- R&D 100 Award for Metal Rubber™
- R&D 100 Award for HybridSil® Fire Blast
- Metal Rubber was recognized as one of NASA's top 13 nanotechnology products
- Micro Nano 25 Award for flexible electronics



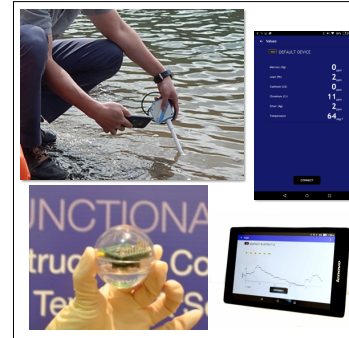
AWARDING THE BEST IN SMALL TECH

Technology and Product:

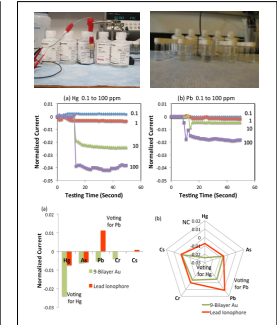
- An array of ChemFET sensor devices combined with NanoSonic's patented **molecular-level self-assembly** technique yields individual sensors that are both sensitive and selective to specific heavy metal target molecules
- Wireless interconnection** will allow data from a ChemFET array probe to be transmitted to a cell phone or tablet, or data from multiple probes to a fixed central electronics unit that can communicate data to customers via the web
- NanoSonic's chemical sensors can be **portable, flowable, or attachable** to achieve real-time onsite chemical monitoring
- Thin sensing film deposition at room temperature and pressure allows **low-cost manufacturing** of thin films on flexible and rigid substrates
- The layer-by-layer self assembly materials are **inkjet printable** enabling effective sensing array element fabrication



NanoSonic's Roadmap Vision to Develop ChemFET Sensors for Heavy Metal Detections



Wireless Networked Potable and Flowable Chemical Sensors



Sensor Device Characterizations

Company and Team:

NanoSonic has a portfolio of patents to support the transition of nanostructured materials into advanced macroscale products.

NanoSonic has three major technical divisions – Polymer Chemistry, Nanocomposites, and Sensors and Systems – and marketing and business development divisions.

DOE SBIR Team:

- Dr. Hang Ruan, Principal Investigator
- Dr. Yuhong Kang, Nanoelectronics Lead Scientist
- Ms. Liz Gladwin, Chemical Engineer
- Ms. Michelle Homer, Cleanroom Engineer
- Ms. Lianne Sandberg, Software Designer
- Dr. Richard O. Claus, CEO, Director of Advanced Development

