PURDUE INNOVATES | Office of Technology Commercialization

Laser-Induced CuXO Formation on Copper for Enhanced Electrochemical Performance in Non-Enzymatic Glucose Sensing

Eco-friendly copper-oxide coatings directly on copper for long-lasting, non-enzymatic glucose sensing.

Purdue researchers have developed a method for synthesizing Copper-Oxide (CuxO) structures directly onto copper surfaces. This environmentally friendly approach allows for the direct fabrication of electroactive CuxO structures without requiring additional reagents. The synthesized CuxO film can serve as a glucose sensor, maintaining around 90% of its initial sensitivity after fifty days. This innovative technique addresses the longstanding need for a direct, eco-friendly method of synthesizing CuxO structures on copper surfaces, while simultaneously enhancing their electrochemical sensing capabilities.

Technology Validation:

- Cyclic Voltammetry was used to detect presence of high levels of electrochemically active species on the surface of LIO samples

Advantages:

- Environmentally friendly synthesis method without the need for additional reagents

- Direct synthesis of CuxO structures onto copper surfaces

- CuxO structures with enhanced catalytic activity and stability

- Adjustable power output of the laser for controlled synthesis CuxO film can be used in sensor applications

Applications:

Technology ID
2021-RAHI-69536

Category
Digital Health & Medtech/Wearable Health Tech & Biosensors
Semiconductors/Devices & Components

Authors
Rahim Rahimi
Sotoudeh Sedaghat Hoor

Further information
Patrick Finnerty
pwfinnerty@prf.org

View online

- Sensors, e.g. glucose sensor

- Improve patient care and response to glucose levels

TRL:

Intellectual Property:

Utility Patent, N/A, United States

Provisional-Patent, 2021-08-20, United States

Utility Patent, 2022-08-19, United States

Keywords: Biotechnology, Chemical Engineering, Micro & Nanotechnologies, Microfabrication, Sensors