Clean Technology

Electrodes with Low-Cost Replaceable Tips

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing solid-surface working electrodes having detachable tips that may be mass produced and require no cleaning.

Overview

Electrodes routinely are used in electrochemical sensing, fuel cells, batteries and numerous other applications. Critically, the surface of an electrode must be clean before sensing elements can be attached and used. This process is laborious and expensive due to the chemicals and polishing materials involved. Also, with repeated use, the electrode surface can scuff and degrade performance. Electrodes cost hundreds of dollars to replace.

The Invention

UW–Madison researchers have developed a new electrode design incorporating disposable tips. The tips can have a snapping mechanism or embedded magnet that attaches to the main shaft of the electrode. An insulating material seals the connection against any liquid. The tips may be modified with other entities such as nanoparticles, enzymes and antibodies.

Applications

- Electrodes for use in sensing, fuel cells, batteries, glucose measurement and other research

Key Benefits

- Eliminates time-consuming cleaning
- Could make expensive electrodes last longer with more reliable performance
- Design is intuitive and can be implemented with basically any electrochemical application.
- Parts can be mass produced.
- Alternative to screen-printed electrodes, while using more reliable solid reference and counter electrodes
- Good for materials that are grown on a substrate or that cannot be printed such as thin films and carbon nanotube arrays

Stage of Development

Results using several prototypes showed excellent reproducibility and compared favorably with standard electrodes.

Additional Information

For More Information About the Inventors

- Sundaram Gunasekaran

Tech Fields

- Analytical Instrumentation, Methods & Materials : Sensors
- Clean Technology : Energy storage, delivery & resource efficiencies

For current licensing status, please contact Michael Carey at mcarey@warf.org or 608-960-9867