Student moves from theory to proof in fuel cell research

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Sadia Kabir is exploring a new world in the basement of Farris Engineering Building. The Ph.D. engineering student works in the research group headed by University of New Mexico Distinguished Professor of Chemical and Biologicall Engineering Plamen Atanassov.

This kind of graphene-supported catalysts for fuel cells has great promise. For example, they can oxidize organic fuels like ethanol produced from bio-feedstocks, waste such as waste from corn production or the fermentation of sugar cane to generate small amounts of electricity. Moreover, the catalytic activity of the materials can be utilized as a source of other useful chemicals.

The UNM research group closely collaborates with colleagues in France at the University of Portiers and in Germany at the Franunhofer Institue for Chemical Technology, ICT. They cooperate to publish academic articles, the latest of which appears in the "Journal of the Electrochemical Society," titled "Palladium Supported on 3D Graphene as an Active Catalyst for Alcohols Electrooxidation." The researchers have jointly applied for multiple patents for various stages of the process.

One possible application for the research is to place the devices in proximity to agricultural plants or waste water treatment plants. The feed stock materials would pass through the devices, which will produce fuel for the fuel cells, generate some electricity and produce useful chemicals.

UNM Research Professor in Chemical and Biomedical Engineering Alexey Serov says the idea is to find a way to produce useful chemicals and fuel from agricultural waste products in an environmentally efficient process that will produce no emissions.

More information: Alexey Serov et al. Palladium Supported on 3D Graphene as an Active Catalyst for Alcohols Electrooxidation, *Journal of The Electrochemical Society* (2015). DOI: 10.1149/2.0301512jes

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