

## Economical and high performing Electrocatalyst

OTT ID# 1328

### APPLICATIONS

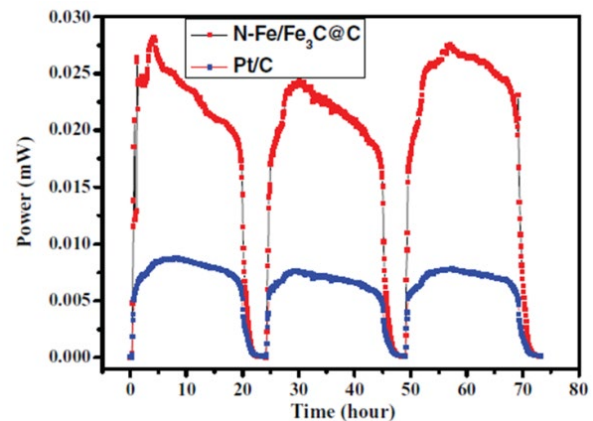
Fuel cells with neutral phosphate buffer, alkaline, and acid solutions, including in microbial fuel cells (MFC) and metal-air batteries

### KEY FEATURES

- **Low Cost Raw Materials** – Materials estimated 5% of platinum-based catalyst cost.
- **Easy and Scalable Manufacturing** – Bulk chemical and thermal reduction processing.
- **Broad Application Potential** – Functional in neutral, alkaline, and acid based fuel cells.

### TECHNOLOGY

The technology is an oxygen reduction reaction (ORR) catalyst made of nitrogen-enriched graphite shells with iron-based composite nanorod cores. This nitrogen-enriched graphite iron nanorod catalyst, in specific tests conducted with an H-type MFC, has a measured charge efficiency of 57%, outperforming the charge efficiency of a conventional platinum-based catalyst by more than a factor of 1.75. This advanced electrocatalyst has a kinetic current density of 26.89 mA cm<sup>-2</sup> at 0V, compared to 14.20 mA cm<sup>-2</sup> for platinum-based catalysts.



### INTELLECTUAL PROPERTY

US patent [US10128510B2](#) was granted in 2018.

### INVENTOR(S)

[Junhong Chen](#) and Zhenhai Wen

### Related Publications

Wen et al. "[Nitrogen-Enriched Core-Shell Structured Fe/Fe<sub>3</sub>C-C Nanorods as Advanced Electrocatalysts for Oxygen Reduction Reaction](#)," *Advanced Materials*, Volume 24, Issue 11, February 2012

Xiao et al. "[Carbon/iron-based nanorod catalysts for hydrogen production in microbial electrolysis cells](#)," *Nano Energy*, Volume 1, June 2012

### For more information please contact:

[Smruti Patil](#), Ph.D., IPMM | *Licensing Associate* | Tel: 414-906-4657  
UWM Research Foundation | 1440 East North Avenue | Milwaukee, WI 53202