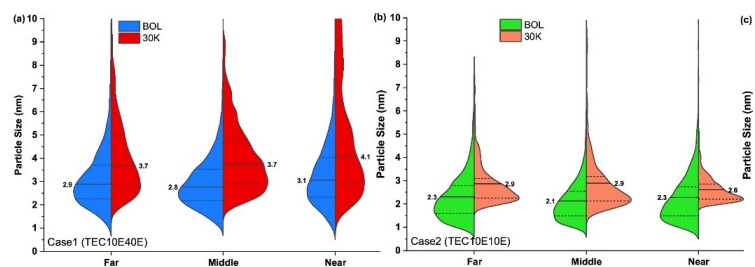
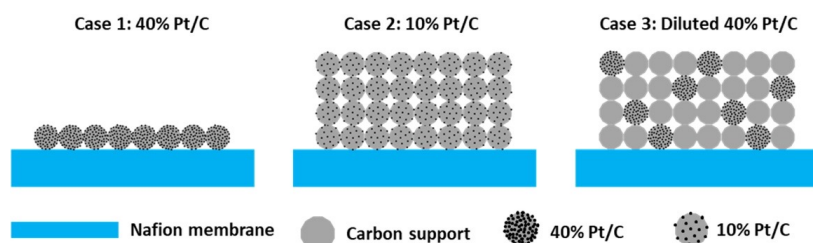


Electrocatalyst Performance Controlled by Pt Weight and Distribution

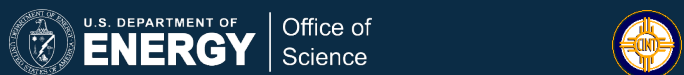
Scientific Achievement

The authors studied how Pt wt% and the type of carbon used as support influence the performance and durability of proton-exchange membrane fuel cells (PEMFCs).



a) Schematic illustration of fuel cell cathodes made with different metal wt% of the Pt/C catalyst. (b) Pt particle size and distribution before and after 30,000 cycles.

Work was performed, in part, at the Center for Integrated Nanotechnologies.



Significance and Impact

These findings will help guide the design of fuel cell electrodes, especially when dealing with the selection of carbon support and loading of expensive Pt catalyst.

Research Details

- The study elucidated the effect of local and average Pt wt% on fuel cell performance and durability after 30,000 cycles.
- Pt wt% is the main factor controlling durability of Pt on a high surface area carbon (HSC) substrate.
- For Pt on a Vulcan substrate, durability and performance are less dependent on Pt wt%.

Wang, X.; Li, D.; Pan, Y.-T.; Chen, K.; Burns, K.; Kim, Y. S.; Wu, G.; Watt, J.; Spendlow, J. S. Effect of the Catalyst Metal Content and the Carbon Support on Proton-exchange Membrane Fuel Cells Performance and Durability. *Electrochim. Acta* 2024. 145490.



<https://science.osti.gov/>