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Fluorination Effect on Non-Noble Metal Catalysts for Fuel Cell Application

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The development of high-performance and cost-effective clean energy technologies is essential to combat global environmental pollution and energy crises. A fuel cell is an energy conversion device that directly converts the chemical energy of a fuel (often H_2) into electricity. Hydrogen fuel cell has the advantages of high efficiency, high energy density, and zero emissions (with the by-products of only water and heat), and is a key frontier technology to achieve a "low-carbon" society. However, the large-scale commercial application of hydrogen fuel cells is still facing bottlenecks such as high cost. The use of rare and expensive Pt-based catalysts is one of the key factors for the high cost of fuel cells. Therefore, new strategies have been developed to design low-cost, high-performance non-noble metal (Pt-free) catalysts to replace Pt-based catalysts for fuel cells. Despite much progress achieved, grand challenges still exist, especially insufficient stability. In this talk, I will introduce the recent research progress of our team on non-noble metal catalysts, including the fluorination effect on the Fe-based catalysts in fuel cells.

Bio: Prof. Gaixia Zhang is Marcelle-Gauvreau Engineering Research Chair Professor at Department of Electrical Engineering, École de Technologie Supérieure (ÉTS), Montréal, Canada. Her research interests focus on Advanced Nanomaterials and electrode/electrolyte interfaces for Sustainable Energy Conversion and Storage Devices, including Hydrogen Fuel Cells, H_2 production, Batteries, and CO_2 conversion. She has published over 120 peer-reviewed articles in top journals including *Energy Environmental Science, Advanced Materials, Advanced Energy Materials, Angew. Chem. Int. Ed., ACS Energy Letters, Applied Catalysis B, Nano Energy*, etc. She has authored 11 book chapters and holds 4 US patents.