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Functionalization of Graphene Oxide by Atomic Layer Deposition using Titanium Oxide for Improving Electrocatalysis ANGELA MACEDO ANDRADE, SIMRANJIT GREWAL, ALIREZA KARIMAGHALOO, MIN HWAN LEE, Univ of California - Merced — Oxygen reduction reactions (ORR) is a lethargic process that lowers the efficiency of renewable energy devices such as fuel cells and metal air batteries. Though ORR can be effectively catalyzed by platinum, and other known catalyst, there is still a persistent search for a catalyst material that is inexpensive and more effective. Recent studies have shown that the titanium oxide (TiO_x) can have catalytic activity towards ORR. This study investigates the catalytic activities of titanium oxide incorporated onto graphene oxygen (GO) by atomic layer deposition (ALD). The catalytic activity was systematically measured by cyclic voltammetry (CV) and linear sweep voltammetry (LSV) using a rotating disk electrode (RDE). Evidence shows that TiO_x bonded on the surface of GO is catalytic active. Comparing the CV before and after ALD of TiO_x the catalytic activity increased. Temperature effects were measured by electrochemical techniques and the trends show that at higher temperature there is an increase in catalytic activity, which is due to the simultaneous reduction and addition of TiO_x during ALD.

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