Short Communication

Pt Submonolayer Decorated PdAu/C Nanocatalyst for Oxygen Reduction Reaction

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doi: 10.20964/2018.10.05

Received: 2 March 2018 / Accepted: 7 July 2018 / Published: 1 September 2018

We measured the activity of nanocatalyst, comprising Pt submonolayer decorated PdAu/C substrate (donated as Pt-PdAu/C) with Pd/Au atomic ratio 4/1, in the oxygen reduction reaction in acidic media. The Pt-PdAu/C is synthesized via a spontaneous displacement reaction, which involves placing a small amount of Pt on carbon-supported PdAu nanoparticles. The decorated nanostructures are confirmed by an array of analytical techniques including transmission electron microscopy (TEM), X-ray diffraction (XRD) and X-ray photoelectron spectroscopy (XPS). Rotating disk electrode measurements show that the current density of Pt-PdAu/C nanocatalyst has 1.4 times higher than a commercial Pt/C for oxygen reduction reaction. The enhanced activity of the Pt-PdAu/C is derived from the combination of the synergistic effect of Pt submonolayer and of the PdAu alloy. Implications of these findings to the design of highly active low Pt loading nanocatalysts are discussed, along with their enhanced electrocatalytic performance in the fuel cell.

Keywords: Pt submonolayer, Oxygen reduction reaction, PdAu, Fuel Cells, Electrocatalyst.

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