

The Effects of Graphene Sheet Size on Electrocatalytic Reactions of Reduced Graphene Oxide-Supported Pt nanoparticles

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Due to its excellent properties such as large surface area, high electrical and thermal conductivity, graphene receives huge attention in various research fields. In this work, the graphene oxide (GO) synthesized by the modified Hummers method was separated according to the sizes through pH induced selective precipitation. To synthesize the reduced graphene oxide-supported Pt catalysts, the Pt nanoparticles were deposited on the size-selected GO sheets by using simultaneous chemical reduction of the Pt precursors and GO. The physicochemical characteristics of prepared catalysts were investigated by SEM, TEM, XRD, and XPS. Moreover, to compare the electrocatalytic properties, these catalysts were applied for both MOR and ORR in acidic media. [This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIP) (No. 2014R1A2A1A11052414) and the Core Technology Development Program for Next-generation Solar Cells of Research Institute for Solar and Sustainable Energies (RISE), GIST.]