Highly active graphene-derived electrocatalyst for oxygen reduction reaction in acidic media

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Highly active graphene-derived electrocatalysts are prepared via heat-treatment with dicyandiamide and a small amount (<1wt%) of transition metals. Oxygen reduction reaction (ORR) activity of the synthesized catalysts is measured in an acidic media. Modified catalyst exhibits 0.9V (vs. RHE) of onset potential while bare graphene shows 0.58V. Herein, it is proposed that restacking of a few layers (5~7 layers) is more preferred in the ORRs rather than a single layer catalyst, through correlation between the ORR activities and the number of graphene layers restacked.