

Role of graphene as a catalyst support in direct liquid fuel cells

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Highly dispersed and stable Pt and Pd on graphene nanosheets (GNS) catalysts were synthesized via a colloidal method using graphene oxide formed by chemical exfoliation. GNS can provide an efficient 2-D planar structure where metal nanoparticles may be able to deposit with maximum utilization so that particle size control and its distribution on GNS are more favorable compared to commercially available carbon black, especially Vulcan-XC. Even in case of more than 60% Pd, homogenous deposition is readily achievable in conjunction with smaller particle size. However, due to the morphological characteristics of graphene oxide or the formation of larger catalysts aggregate, superior electrocatalytic activity cannot be obtained. An important advantage of this catalyst support is to provide strong metal-support interaction, thereby increasing catalyst stability of Pd catalyst for formic acid oxidation.