

Dendritic Pt Nanoparticles with Enhanced Activity and Durability for PEMFC Catalyst

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Shape-controlled platinum nanoparticles can offer enhanced catalytic properties. Especially, dendritic shape has attracted interests for electrocatalytic application due to its considerable advantages of high surface area. Here, we synthesized dendritic Pt nanoparticles by reducing aqueous mixture of K_2PtCl_4 and TTAB with L-ascorbic acid. Various sizes of dendritic Pt nanoparticles were synthesized by changing the reduction temperature. The dendritic Pt nanoparticles were tested for oxygen reduction reaction (ORR) and their activity and durability were evaluated. These results were compared with commercial Pt/C catalysts (E-tek) and showed that dendritic Pt nanoparticles are more active based on equivalent Pt mass for ORR. Particularly, durability of dendritic Pt nanoparticles is much better than Pt/C. We also investigated size effect of dendritic Pt nanoparticles for ORR activity and durability.