

Intermetallic nanostructures for stable cathode catalysts in PEMFCs

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Research has been focused on efficient renewable energy sources. Among them, proton exchange membrane fuel cells (PEMFCs) are drawing a lot of attention because of their potential application to electrical devices and automotive engines. However, commercialization of PEMFC is confronted with insufficient durability of Pt-based cathode catalyst. Presently the most widely used catalyst is 2-5 nm sized Pt nanoparticles supported on carbon black .

Ordered intermetallic phases provide precise control of structural, geometric, and electronic effects, which are not allowed by normal alloys with random position of Pt and transition metals. In addition, recent studies on various intermetallic phases including FePt, CuPt, and CoPt have showed that Pt-based intermetallic structures have enhanced ORR activity and durability.

In this research, we study the intermetallic FePt nanostructures as cathode catalysts in PEMFCs. They showed enhanced specific activity and durability compared to Pt/C, because of their intermetallic phase.