

Design & Fabrication of Nano Structure for Fuel Cells

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One of the most significant issues in the development of highly efficient fuel cells involves the design and synthesis of nano-electrode materials and structure which serve to improve the electrocatalytic activity and decrease the amount of noble metal catalyst required. Pt-based alloy or non-Pt-based nanoparticles were synthesized and their properties were characterized by various measurements. According to our analysis, optimized sizes, shapes and structures of nanoparticles were necessary for excellent electrocatalytic activities. In addition, the enhanced activities were caused by the change in the electronic structure and electron and proton transfers. Therefore, materials design of Pt or non-Pt-based electrocatalysts would enable fuel cells to enhance the performance by combining these effects together. Further we designed and fabricated novel nanocomposite electrode structures consisting of metal/metal alloy and oxide using a co-sputtering system with metals and oxides target. The relationship between these nano-electrodes and electrocatalytic activities will be presented in the Symposium.