

Synthesis and Characterization of bimetallic PtRu nanowires via electrospinning for methanol electro-oxidation

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Direct methanol fuel cell (DMFC) is one of the candidates for alternative power source to overcome problems of fossil fuel. However, DMFC still has some drawbacks such as CO poisoning, sluggish reaction and need of high loading platinum. To solve these problems, we suggest 1-dimensionally nanostructured electrocatalyst such as nanowires (NWs) for enhancing charge transport compared with nanoparticles. Electrospinning process is an easily controllable manner to synthesize NWs in mass production for electrocatalysts. Until now, polymer and metal oxide NWs have been fabricated by electrospinning. Recently, metal NWs of Cu, Fe, Co and Ni could be made for magnetic materials. In this work, because PtRu bimetallic catalyst is well known as an electrocatalyst for methanol electrooxidation, PtRu NWs were synthesized through electrospinning method. The structural properties of PtRu NWs were characterized by field emission scanning electron microscope (FESEM), transmission electron microscope (TEM), and X-ray diffraction (XRD). Electronic states of Pt during synthesis steps were analyzed into X-ray absorption fine structure (XAFS).