The Performance of a Novel PdFe/B-N-G Catalys for Ethanol Electro-oxidation in Alkaline Medium

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Palladium catalyst (Pd) are made attention to application in alcohol fuel cells due to unique performance, as well as the resource abundance and low cost, but the catalyst performance and stability of the catalysts are still not satisfied. In this article, the novel PdFe/B-N-G catalysts with the double element alloying and dual-doping for ethanol electro-oxidation are successfully prepared and determined by XRD, TEM and XPS. TEM results reveal a relatively uniform and high dispersion of Pd particles is observed on PdFe/B-N-G catalyst. The XPS analysis indicates that Pd(0) contents of the PdFe/B-N-G catalyst are increased on account of the B, N-doping effect. Being explored as the catalyst to the ethanol oxidation reactions, the PdFe/B-N-G catalysts exhibit the better electrocatalytic activity with higher current densities and catalyst stability compared to those of PdFe/G and Pd/B-N-G, which can be attributed to the synergistic effect of the enhanced PdFe alloying and the B, N-doping, that can produce more activity sites dispersing on the surface of graphene. Thus, the novel PdFe/B-N-G catalysts can be the potential alternate in alcohol fuel cells.

Keywords: Ethanol Electro-oxidation; PdFe catalyst; B, N doping; Alcohol Fuel Cells.

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