The preparation and characterization Ag and Ag alloy catalysts supported on treated carbon for DEFC

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Abstract: Alloy catalysts have been proposed as cathode material for direct ethanol fuel cell (DEFC). The alloy first row transition catalysts were tested to improve the activity of oxygen reduction reaction (ORR). In this research, 20% wt. Ag and AgNi were prepared to support on treated carbon (Carbon Vulcan XC-72 by hydrogen peroxide) by NaBH4 reduction method in ethylene glycol at room temperature. The XRD pattern confirmed Ag on carbon and AgNi-alloy on carbon. The EDS indicated that metals (Ag and Ni) including oxygen and carbon are major elements in the prepared catalysts. The SEM and TEM images showed good dispersion of metals on treated carbon support. The particles size of Ag and AgNi-alloy on carbon support were 13.90±1.10 nm. The DEFC testing indicated that 20% AgNi/C catalysts exhibited higher electrical power than standard catalyst (Pt/C).

Keywords: DEFC; Ag; Ag-alloy; Catalysts; NaBH4