

Preparation and Characterization of Pt/C Nano-Catalysts by Polyol Process

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The synthesis of nanometer-sized noble metal particles with uniform distribution in catalyst for fuel cell is important in catalytic process due to their high surface area per unit volume. Researchers have been paying lot of attention to the size and shape of the nano particle by investigating newer synthetic procedures. Among the available techniques conventional preparation methods based on wet impregnation and chemical reduction of the metal precursors often do not provide adequate control of particle shape and size. But the polyol process has been proven to be an effective method for the noble metal nano particles, such as Pt, Ru, Ag and Pd. Recently, Pt/C nano particles have also been successfully synthesized by polyol process. Through this work we examined the effect of preparation conditions on the properties of Pt particles in the polyol process. The effect of pH on the stability of the colloidal solution and the dependence of particle size on the concentration of sodium hydroxide were studied with high resolution transmission electron microscopy (HRTEM), ICP and electrochemical experiments including cyclic voltammetry (CV), and rotating ring disk electrolyte (RRDE).