Preparation of Pt/nanographene paste using alcohol in-liquid plasma for fuel cell application

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Platinum (Pt) nanoparticle/nanographene paste was prepared for the fuel cell application. In this study, nanographene was synthesized using a high-density in-liquid plasma with ethanol as the carbon precursor [1]. After the synthesis of nanographene in ethanol, Pt colloidal solution was added and the methanol with nanographene and Pt colloid was stirred to disperse the Pt nanoparticles on the surface of nanographene. Figure 1 shows TEM image of nanographene supporting Pt nanoparticles. Highly dispersed Pt nanoparticles supported on the surface of nanographene could be observed with a diameter of approximately 3 nm. Furthermore, the electrocatalytic activity of Pt nanoparticle/nanographene paste was evaluated using the cyclic voltammetry (CV) employing a standard three-electrode cell. The glassy carbon electrode loaded with Pt nanoparticle/nanographene paste was used as the working electrode. The electrochemical active surface areas (ECSA) of the catalysts were estimated from the coulombic charge for the hydrogen adsorption in the CV. As a result, the relatively high electrocatalytic activity was evaluated using the electrochemical measurement.


Fig.1 TEM image of nanographene supporting Pt nanoparticles.