Short Communication

Enhanced Activity for Methanol Electro-oxidation on PtRu/C Catalyst by Reduction Treatment

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doi: 10.20964/2017.07.62

Received: 29 March 2017 / Accepted: 9 May 2017 / Published: 12 June 2017

Modified ethylene glycol method was used to synthesize PtRu/C catalyst which then annealed at different temperatures in hydrogen atmosphere. By X-ray diffraction, scanning and transmission electron microscopy, energy dispersive spectroscopy and inductively coupled plasma atomic emission spectroscopy, the structure and composition of catalysts were analyzed; Simultaneous thermal analysis tests gave the mass loss and thermal effect of the catalysts. Electrochemical methods were used to evaluate electro-catalytic activity of the catalysts towards CO and methanol electro-oxidation. The results showed that the average particle size and PtRu alloy crystallinity increased during the reduction treatment. Most of the surface adsorption species were removed after reduction treatment at 300 °C due to the decomposition temperature ranges of 110 ~ 220 °C. The catalyst with reduction treatment at 300 °C exhibited the highest electrocatalytic activities, which was attributed to the removal of adsorption species, the increase of crystallinity and the formation of grain boundary.

Keywords: PtRu/C; reduction treatment; electro-catalytic activity; methanol electro-oxidation; CO tolerance

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