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# The Influence of Potential Scanning Rate on the Electrocatalytic Activity of Pyrolysis-treated PdO/Graphene for Ethanol Oxidation Reaction (EOR)

*Yuying Chen*[1], *Min Cui*[2], *Sen Li*[3], *Jing Zhao*[1], *Yan Zhang*[1], *Binjuan Wei*[1], *Keqiang Ding*[1,3*]

[1]College of Chemistry and Materials Science, Hebei Normal University, Shijiazhuang 050024, P.R. China
[2] School of Sciences, Hebei University of Science and Technology, Shijiazhuang 050018, P.R. China
[3] Fengfan Co., Ltd, Baoding, Hebei 071057, P.R. China
[*]E-mail: dkeqiang@263.net

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For the first time, the influence of potential scanning rate on the electrocatalytic activity of pyrolysis-treated PdO/Graphene (denoted as PdO/G) was investigated in this work. First, a suspension solution that contained PdO and graphene was pyrolyzed under certain conditions, and then the products were anchored on a glassy carbon (GC) electrode, leading to the formation of pyrolysis-treated PdO/G coated GC electrode. Lastly, the resultant electrodes were potentially scanned using cyclic voltammetry (CV) technique for 50 cycles at various scanning rates in a potential range, yielding four kinds of CV-treated PdO/G electrodes. In this work, the electrodes obtained at the scan rate of 5, 10, 50, 90 mV $s^{-1}$ were, respectively, denoted as catalyst **a**, **b**, **c** and **d**. The morphologies of the samples were mainly characterized via scanning electron microscope (SEM) and transmission electron microscopy (TEM). The electrocatalytic activities of the as-prepared catalysts for ethanol oxidation reaction (EOR) were principally studied by using cyclic voltammetry (CV) and chronoamperometry (CA). The electrochemical results strongly indicated that the catalyst of PdO/G treated by 10 mV $s^{-1}$ exhibited the best electrocatalytic performance among all the prepared catalysts. The relatively smaller particle size and higher content of Pd were thought as the major reasons for the excellent electrocatalytic activity of catalyst **b** towards EOR when compared to other catalysts.

**Keywords:** PdO, graphene, pyrolysis, scanning rate, ethanol oxidation reaction, electrocatalysis

FULL TEXT