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Short communication

The Electrocatalytic Activity of the Pyrolysis Products of the Mixture Containing PdO and $PdCl_2$ and Multi-walled Carbon Nanotubes (MWCNTs) for Methanol Oxidation Reaction (MOR)

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In this work, three kinds of catalysts were respectively prepared from the mixture of PdO+$PdCl_2$+MWCNTs (catalyst a), $PdCl_2$+MWCNTs (catalyst b) and PdO+MWCNTs (catalyst c) by using a pyrolysis method. And their characterizations were basically conducted via X-ray diffraction (XRD) and transmission electron microscopy (TEM). The XRD results indicated that metallic Pd as the main component was prepared in catalyst a and b. The particle size for catalyst a, b and c was approximately estimated to be 15nm, 10nm and 20 nm, respectively, basing on the TEM images. And the electrocatalytic activities of the obtained catalysts for methanol oxidation reaction (MOR) were investigated mainly through cyclic voltammetry (CV) and chronoamperometry (CA). And the results effectively illustrated that catalyst a showed the best electrocatalytic activity toward MOR among all the prepared catalysts. Showing the fact, that the pyrolysis products of the mixture having PdO and $PdCl_2$ and MWCNTs had an unexpected electrocatalytic activity towards MOR, is the main contribution of this work, which can greatly reduce the preparation cost of Pd-based catalyst.

Keywords: PdO, $PdCl_2$, pyrolysis; multi-walled carbon nanotubes; electrocatalyst; methanol oxidation reaction.

FULL TEXT