

## Accepted Manuscript

Title: Rapid synthesis of dendritic Pt/Pb nanoparticles and their electrocatalytic performance toward ethanol oxidation

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PII: S0169-4332(17)31925-6  
DOI: <http://dx.doi.org/doi:10.1016/j.apsusc.2017.06.270>  
Reference: APSUSC 36470

To appear in: *APSUSC*

Received date: 24-5-2017  
Revised date: 21-6-2017  
Accepted date: 26-6-2017

Please cite this article as: Ke Zhang, Hui Xu, Bo Yan, Jin Wang, Zhulan Gu, Yukou Du, Rapid synthesis of dendritic Pt/Pb nanoparticles and their electrocatalytic performance toward ethanol oxidation, *Applied Surface Science* <http://dx.doi.org/10.1016/j.apsusc.2017.06.270>

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# **Rapid synthesis of dendritic Pt/Pb nanoparticles and their electrocatalytic performance toward ethanol oxidation**

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## **Highlights**

Pt/Pb nanodendrites have been prepared by heating in an oil bath for 5 min.

Pt<sub>1</sub>/Pb<sub>1</sub> nanodendrites exhibit enhanced electrocatalytic performance and stability.

The presence of Pb enhance the Pt catalytic activity toward ethanol oxidation.

## **Abstract**

This article reports a rapid synthetic method for the preparation of dendritic platinum–lead bimetallic catalysts by using an oil bath for 5 min in the presence of hexadecyltrimethylammonium chloride (CTAC) and ascorbic acid (AA). CTAC acts as a shape-direction agent, and AA acts as a reducing agent during the reaction process. A series of physical techniques are used to characterize the morphology, structure and electronic properties of the dendritic Pt/Pb nanoparticles, indicating the Pt/Pb dendrites are porous, highly alloying, and self-supported nanostructures. Various electrochemical techniques were also investigated the catalytic performance of the Pt/Pb catalysts toward the ethanol electrooxidation reaction. Cyclic

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