Electrochemical Deposition of Carambolalike Ytterbium Hexacyanoferrate(II) and its Application in Electrocatalysis

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Authors	Liang Dong Feng, Bo Qing Chen, Ya Xin Gu, Xiao Chun Cheng, Jie Wu, Wei Gang Du, Deng Hao Li
Keywords	Carambolalike, Electrocatalysis, Electrochemical Deposition, Ytterbium Hexacyanoferrate

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First page example

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Electrochemical Deposition of Carambolalike Ytterbium Hexacyanoferrate(II) and Its Application in Electrocatalysis

Liangdong Feng[a], Boqing Chen, Yaxin Gu, Xiaochun Cheng, Jie Wu, Weigang Du and Denghao Li

Faculty of Life Science and Chemical Engineering, Huaiyin Institute of Technology, Key Laboratory for Palygorskite Science and Applied Technology of Jiangsu Province, Huaian 223003, China

[a] ldfeng@hyit.edu.cn

Keyword: Electrochemical deposition; Carambolalike; Ytterbium Hexacyanoferrate; Electrocatalysis

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Introduction

Metal hexacyanoferrates (MHCFs) have attracted considerable interests due to their attractive electrocatalytic, ion-sensing and ion-exchange properties. Of interests, the electrodeposition and applications of transition-metal hexacyanoferrates have been widely studied, especially as the effective catalysts for hydrogen peroxide [1-3]. In particular, the synthesis and/or properties of lanthanide hexacyanoferrate (LnHCF) (that is, Ln = La, Ce, Pr, Nd, Sm, Eu, Gd, Tb and Dy) have been investigated. As an analog, ytterbium hexacyanoferrate (YbHCF) may have the similar electrocatalytic properties to these LnHCFs. However, to the best of our knowledge, very few reports have been found regarding electrochemical preparation and electrocatalytic properties for ytterbium hexacyanoferrate(II) (YbHCF(II)).

During the past several years, the development of reliable, simple and efficient route to large amounts of uniformly sized and novel structured materials has been one of the main goals in materials chemistry research. Many kinds of MHCFs have been successfully synthesized via various preparation methods. However, most of the methods have been focused on photo-inducing or protecting using organic materials [4-7]. The products having mostly cube, and the shape- and size-dependent properties of MHCFs have been seldom reported. Therefore, controlling the growth of MHCFs under spatial confinement is a promising subject.

Herein, a facile amperometric method is reported to synthesize carambolalike YbHCF(II) microparticles. The structure, composition and morphology of the YbHCF(II) were characterized with techniques such as X-ray powder diffraction (XRD), energy-dispersive X-ray spectrum (EDS) and scanning electron microscopy (SEM). The YbHCF(II) modified Au electrode exhibits good electrocatalytic activity toward the reduction of hydrogen peroxide.