

Accepted Manuscript

Title: Electrocatalytic hydrogenation of furfural to furfuryl alcohol using platinum supported on activated carbon fibers

Author: Bo zhao Mengyuan Chen Qingxiang Guo Yao Fu

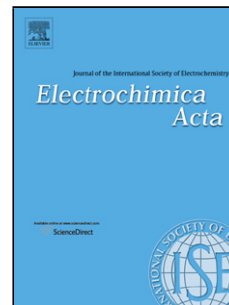
PII: S0013-4686(14)00944-X
DOI: <http://dx.doi.org/doi:10.1016/j.electacta.2014.04.164>
Reference: EA 22670

To appear in: *Electrochimica Acta*

Received date: 10-3-2014
Revised date: 25-4-2014
Accepted date: 28-4-2014

Please cite this article as: B. zhao, M. Chen, Q. Guo, Y. Fu, Electrocatalytic hydrogenation of furfural to furfuryl alcohol using platinum supported on activated carbon fibers, *Electrochimica Acta* (2014), <http://dx.doi.org/10.1016/j.electacta.2014.04.164>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Electrocatalytic hydrogenation of furfural to furfuryl alcohol using platinum supported on activated carbon fibers

Bo zhao, Mengyuan Chen, Qingxiang Guo* and Yao Fu*

Anhui Province Key Laboratory of Biomass Clean Energy, Department of Chemistry, University of Science and

Technology of China, Hefei, Anhui 230026, P. R. China

Abstract

In this work, electrocatalytic hydrogenation (ECH) of furfural to furfuryl alcohol was studied. Experiments were run in a H-type cell in aqueous solution with a platinum sheet as anode. Platinum (Pt), nickel (Ni), copper (Cu) and lead (Pb) were used as cathode materials. As expected, the cathode material, which serves as the hydrogenation catalyst, was found to have a large effect on the ECH of furfural. Among the cathode materials studied, the Pt gave the best product selectivity. So cathodic reduction was catalyzed by platinum supported on activated carbon fibers (Pt/ACF), a novel electrocatalyst. Incipient wetness impregnation and electrodeposition methods were employed to prepare the electrocatalyst. Catalysts prepared by impregnation method were more active than prepared using electrodeposition method, presumably because of more active surface area. When using impregnation method, 3%Pt/ACF showed the best activity and current efficiency, followed by 5%Pt/ACF. Effects of electrolyte on product yield and current efficiency were also investigated. The yield of furfuryl alcohol was highest in the 0.1M HCl. The initial furfural concentration and the electrolytic potential also strongly affected the product yield and current efficiency.

Key word: furfural; electrocatalytic hydrogenation; activated carbon fibers.

1. Introduction

Production of chemicals and fuels from abundant, renewable biomass and its derivatives

Download English Version:

<https://daneshyari.com/en/article/6613369>

Download Persian Version:

<https://daneshyari.com/article/6613369>

[Daneshyari.com](https://daneshyari.com)