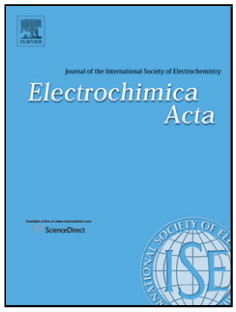

Title: Novel copper oxides oxygen evolving catalyst in situ for electrocatalytic water splitting

Author: Qiang Zhao Genyan Hao Wen Yuan Nan Ma Jinping Li

PII: S0013-4686(14)02287-7
DOI: http://dx.doi.org/doi:10.1016/j.electacta.2014.11.079
Reference: EA 23751

To appear in: *Electrochimica Acta*

Received date: 21-8-2014
Revised date: 23-10-2014
Accepted date: 12-11-2014

Please cite this article as: Qiang Zhao, Genyan Hao, Wen Yuan, Nan Ma, Jinping Li, Novel copper oxides oxygen evolving catalyst in situ for electrocatalytic water splitting, Electrochimica Acta http://dx.doi.org/10.1016/j.electacta.2014.11.079

Novel copper oxides oxygen evolving catalyst in situ for electrocatalytic water splitting

Qiang Zhao,[a] Genyan Hao,[a] Wen Yuan,[b] Nan Ma,[a] Jinping Li [a*]

[a] Research Institute of Special Chemicals, Taiyuan University of Technology, Taiyuan 030024, Shanxi, P.R. China.

[b] Department of Chemistry, Taiyuan Normal University, Taiyuan 030001, Shanxi, P.R. China.

[*] Corresponding author: Prof. Jinping Li; Tel: (+86)351-6010908; fax: (+86)351-6010908; E-mail address: jpli211@hotmail.com (J. Li).

Highlights

- A novel Cu-Ci oxygen-evolution catalyst is synthesized in carbonate solution with Cu(I) complex.
- The catalyst has low oxygen evolution overpotential and high oxygen evolution rate for water splitting.
- It has wide application prospects for water splitting under mild conditions.

Abstract: A Cu-C_i oxygen-evolution catalyst (C_i is inorganic carbonate) is prepared from of the abundant elements copper. They are generated in situ in carbonate solution (pH 10.25) with copper(I) complex under mild conditions (room temperature, atmospheric pressure, and near-neutral solution). The result indicates that the prepared Cu-C_i catalyst is amorphous. The average oxygen-evolution rate is 33.88 μmol h^{-1} cm^{-2}. An oxygen evolution overpotential of 263.8 mV is required at a current density of 1 mA cm^{-2}. Factors affected catalytic activity during water splitting, including temperature