Short Communication

Enhanced Glucose Electrooxidation at Ni-Cu Binary Oxide Nanocatalyst

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doi: 10.20964/2020.03.57

Received: 17 November 2019 / Accepted: 21 December 2019 / Published: 10 February 2020

The aim of this study is to fabricate a nickel (NiOx) and copper (CuOx) oxide nanocatalyst on a glassy carbon (GC) electrode (will be abbreviated as Ni-Cu/GC) for glucose oxidation (GO). A sequential electrodeposition mode was applied to assemble NiOx and CuOx in the fabrication scheme. The optimization of Ni loading on the GC surface (will be abbreviated as Ni/GC electrode) was achieved first to attain the maximum catalytic efficiency in terms of the specific current toward GO. This (409 Ag⁻¹) was obtained by applying 15 mC/cm² in the deposition of Ni. However, unfortunately the NiOx/GC could not support a long-term stability toward GO that motivated a further modification with CuOx beneath NiOx (will be abbreviated as Ni-Cu/GC electrode). This modification enhanced the stability toward the GO where the decay in the specific current was not too much compared with that of the Ni/GC electrode. After 1 h of continuous electrolysis, the specific current reached 317 Ag⁻¹ at the Ni-Cu/GC electrode compared to 167 Ag⁻¹ at the Ni/GC electrode.

Keywords: Glucose electro-oxidation; NiOx; CuOx; Catalytic activity; Stability.

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