Preparation and Electrocatalytic Hydrogen Evolution properties of Lignin-derived Cabon/Ni/NiO Composites

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Received: 3 June 2021 / Accepted: 26 July 2021 / Published: 10 September 2021

In recent decades, the lignin has been numerously abandoned in agricultural and paper industries, which is urging us to find the new usage of it. And in theory, lignin is a kind of available material as carbon source because of its low cost, wide distribution and abundant carbon content. Therefore, researchers intend to make it a flesh porous carbon as new energy material. In this paper, lignin-derived porous carbon was prepared by self-assembly method and combined with Ni/NiO. Then the nanocomposites' structure and hydrogen evolution reaction were studied. The main research contents and results were as follows: Ni/NiO and lignin-driven porous carbon were combined by in-situ synthesis, and the morphology, composition, structure, and electrochemical performance were characterized. It was found that Ni and NiO were indeed absorbed on porous carbon as crystals. The composite's specific surface area measured by BET was $115.4 \text{ m}^2 \cdot \text{g}^{-1}$, while pore volume is $0.04 \text{ cm}^3 \cdot \text{g}^{-1}$. And hydrogen evolution hyperpotential of the composite electrode is 0.446V at 10 mA.

Keywords: lignin; mesoporous carbon; composite electrode; hydrogen evolution reaction

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