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Facile preparation of layered double hydroxide materials for high efficiency oxygen evaluation

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Today, applying of fossil fuels is considered as a challenge and the use of renewable. Clean energy can be as a suitable way for decrease this problem. Energy transport such as hydrogen evaluation reaction (HER) was considered as alternative energy technology in the recent years [1, 2]. The hydrogen can be product using water splitting reaction [3]. Although, the rate of the oxygen evolution process at the water splitting reaction is sluggish [4]. So, a way for obtain high efficiency at water splitting is applying the electrocatalysts which improve the oxygen evaluation reaction (OER). Therefore, OER contains conversion energy and store energy. The present study reported that the NiCr-LDH/SWCNT nanocomposite is as a superior active for oxygen evaluation reaction (OER). The NiCr-LDH/SWCNT composite was synthesized using the ultrasonic sound waves. Based on the characterization analyses such as X-ray diffraction (XRD) patterns, and field emission scanning electron microscopy (FE-SEM) images, the synthesis of NiCr-LDH/SWCNT using the ultrasonic method, was confirmed. Next, the NiCr-LDH/SWCNT composites were used as an effective nanomaterials for OER at near neutral media. The obtained data from the linear sweep voltammetry (LSV) process confirm that NiCr-LDH/SWCNT decreases the overpotential to about 70 mV in comparison with only NiCr-LDH, and RuO_2. The high activity oxygen generation can be attributed to the presence of NiCr-LDH and SWCNT at prepared nanocomposite.

Keywords: Layered double hydroxide, Oxygen evaluation reaction, Water splitting

References

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