

# Vertically Aligned $\beta$ -NiOOH Nanosheet as Highly Active and Stable Catalytic Sites for Oxygen Evolution Reaction in Alkaline Media

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The long-term stability of Ni-based catalysts, employed in the anode of anion exchange membrane water electrolyzers (AEMWE), has been a persisting concern. In this work, through a simple and powerful electrochemical anodization process, vertically aligned  $\beta$ -NiOOH atomic sheets (vertical- $\beta$ -NiOOH) grown on Fe-doped Ni nanoplates (FeNi nanoplates) as a solution are offered. The HRTEM and in-situ XAFS results revealed well-created vertical- $\beta$ -NiOOH on the surface of FeNi nanoplates with  $\text{Ni}^{4+}$  active phase. This innovative electrocatalyst demonstrates sustained stability of constant current density for over 120 days during the oxygen evolution reaction. The zero-gap AEMWE cell harnessing the anodized FeNi nanoplates achieves a remarkable current density of  $2.26 \text{ A cm}^{-2}$  at 1.80 V with an energetic efficiency of 85.1%.

## Paper submission Plan

### Best Presentation

Yes

### Contribution track

ICABU WG4. Applications of Particle Beams

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