

Synthesis of [NiFe]-sulfides derived from NiFe_2O_4 as catalysts for the alkaline hydrogen evolution reaction

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1. Photoelectron spectroscopy (XPS) measurements of the synthesized **NFS** materials.

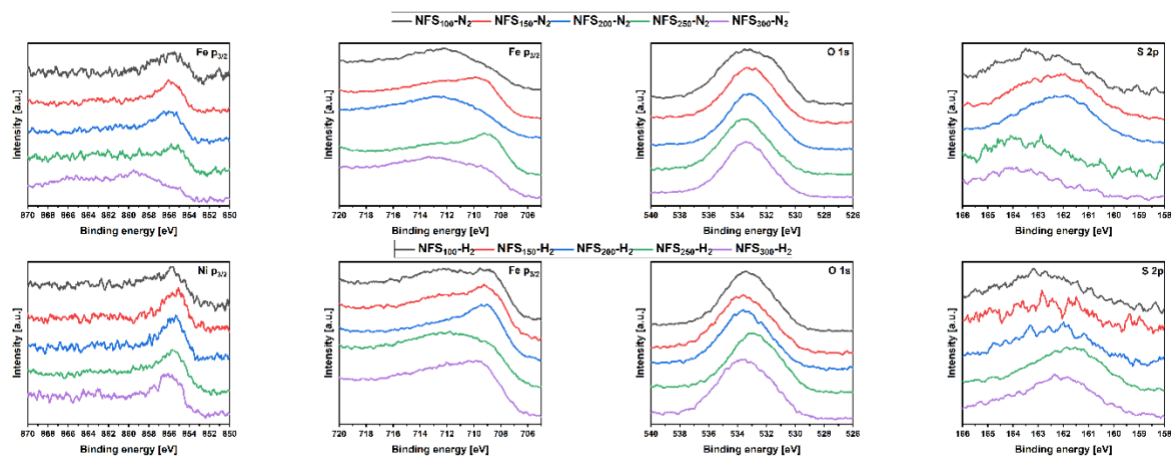


Figure S1: XPS spectra of the **NFS-N₂** and **NFS-H₂** materials

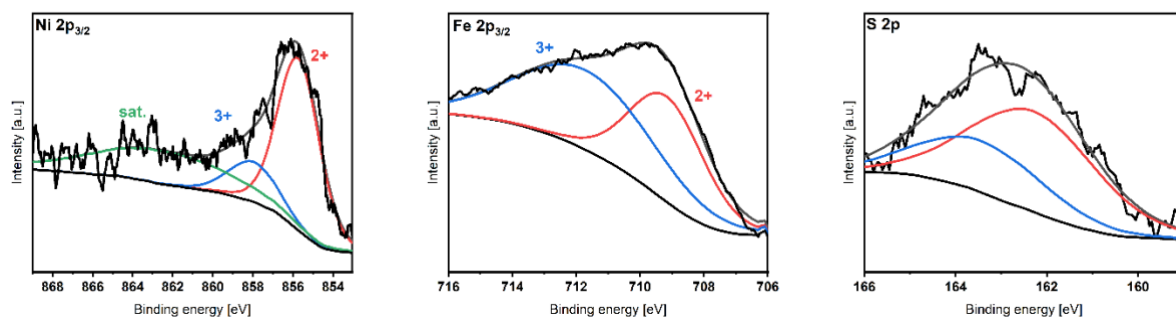


Figure S2: Deconvoluted XPS spectra of **NFS₃₀₀-H₂**.

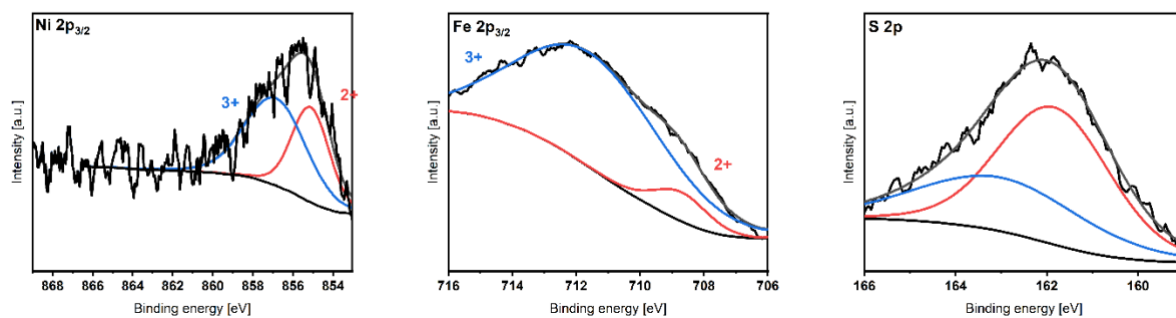


Figure S3: Deconvoluted XPS spectra of **NFS₁₀₀-N₂**.

2. Scanning electron microscopy (SEM) images of the synthesized **NFS** materials.

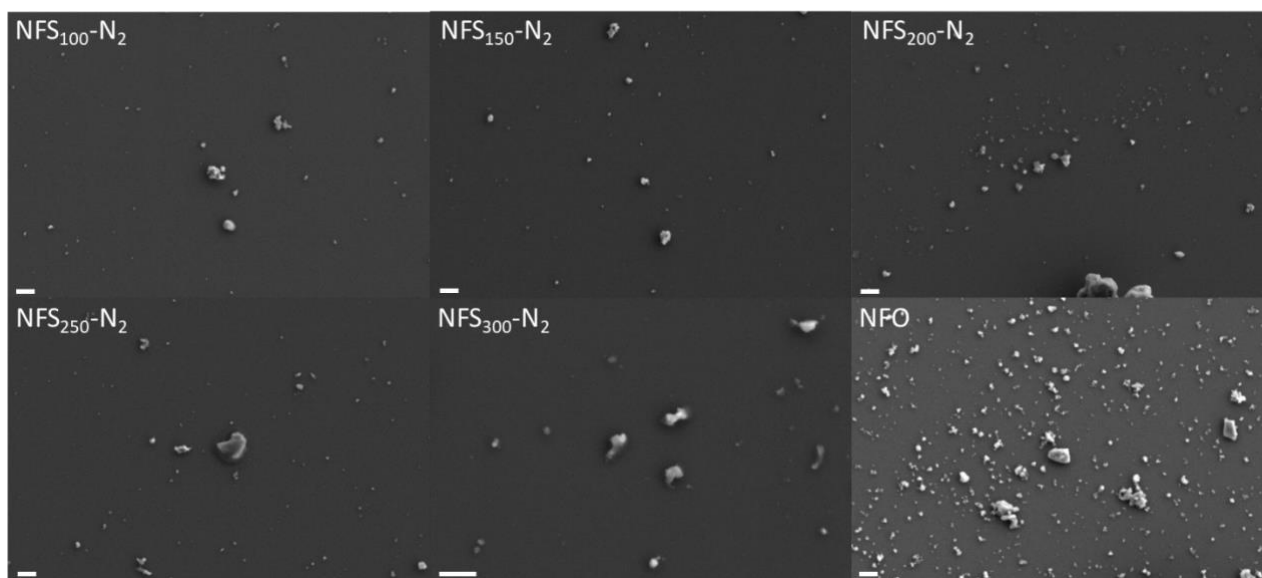


Figure S4: SEM images of the synthesized **NFS-N₂** electrocatalyst materials in comparison to **NFO**. The scale bar is 1 μm .

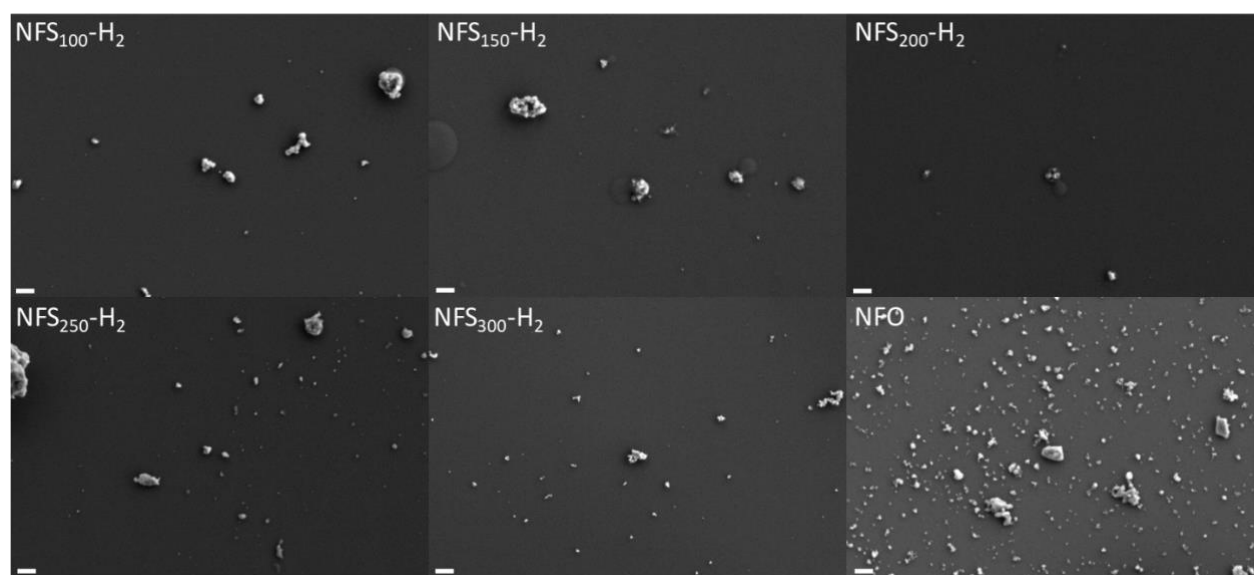


Figure S5: SEM images of the synthesized **NFS-H₂** electrocatalyst materials in comparison to **NFO**. The scale bar is 1 μm .

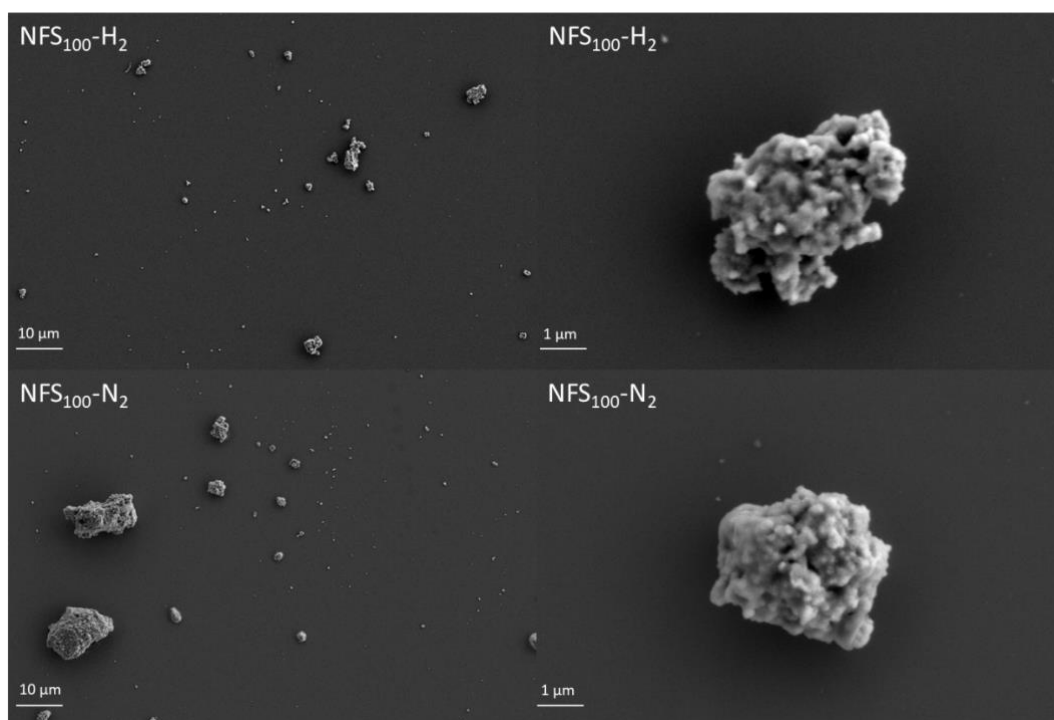


Figure S6: SEM images of the synthesized $\text{NFS}_{100}\text{-H}_2$ and $\text{NFS}_{100}\text{-N}_2$ electrocatalyst materials indicating particle agglomeration.

3. Particle size analysis by laser diffraction of the synthesized **NFS** materials.

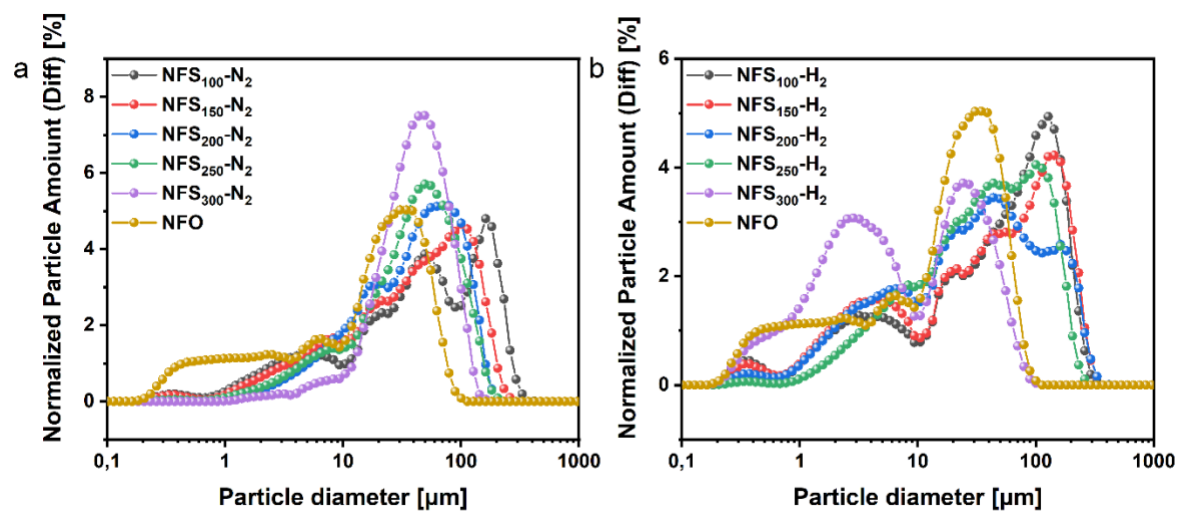


Figure S7: Particle size analysis of the synthesized **NFS** electrocatalysts by laser diffraction.

4. Electrochemical impedance spectroscopy measurements of the synthesized **NFS** materials.

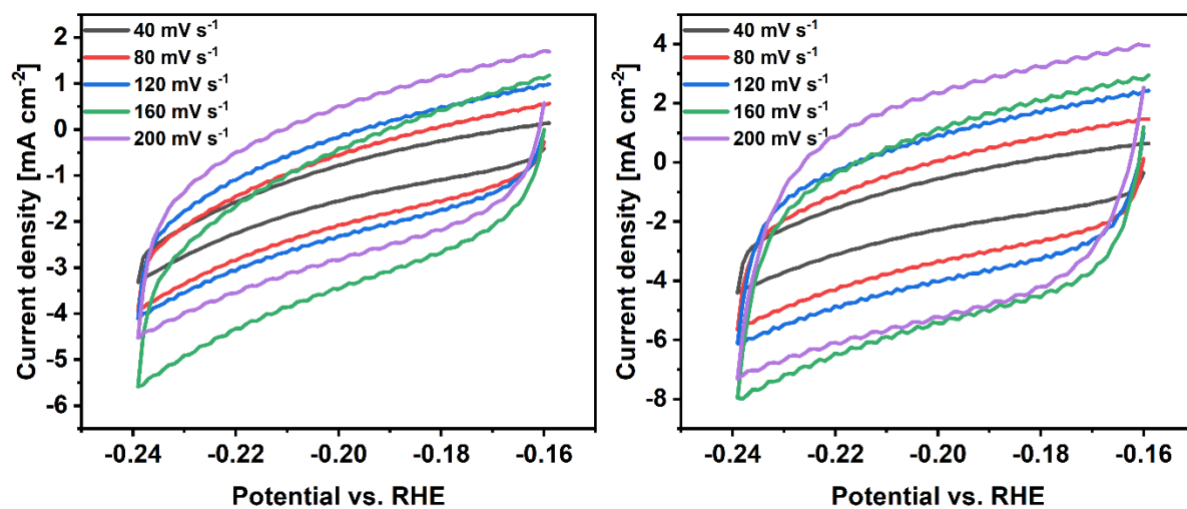


Figure S8: Cyclic voltammetry measurements for the determination of the double layer capacity (C_{DL}). Left: **NFS- N_2** . Right: **NFS- H_2**

- Electrochemical impedance spectroscopy measurements of the synthesized **NFS** materials.

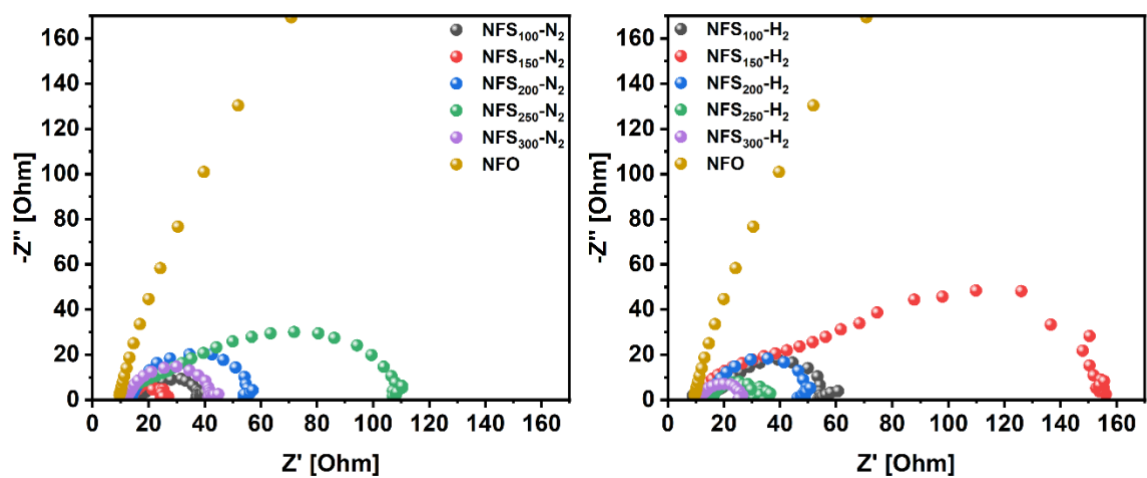


Figure S9: Electrochemical impedance spectroscopy (EIS) measurements performed at -0.4 V vs. RHE from 100 kHz to 0.10 Hz of the synthesized **NFS- N_2** and **NFS- H_2** electrocatalysts.

6. Tafel analysis

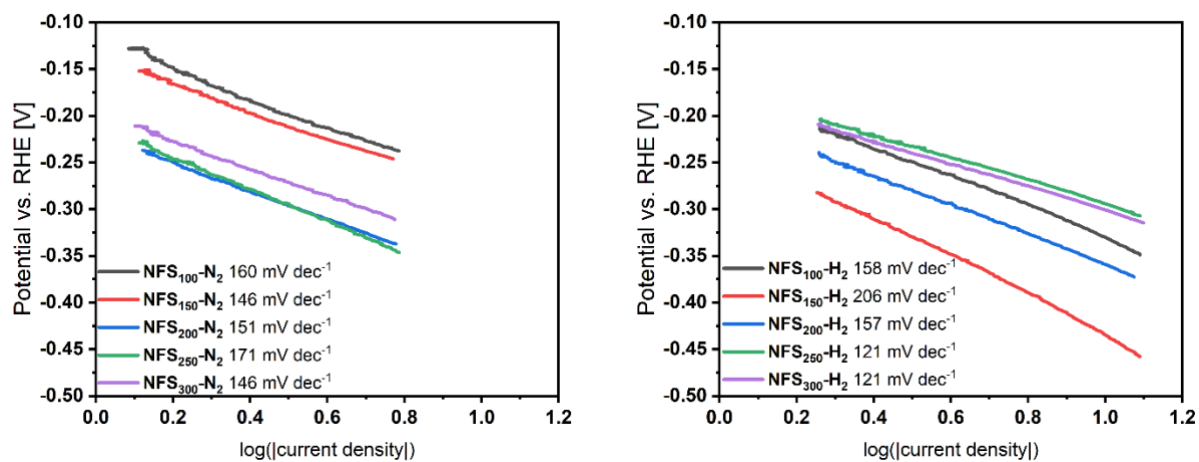


Figure S10: Tafel analysis of the synthesized **NFS** materials.