

Figure 1. NiS_x ALD characteristics: growth rate and resistivity versus a) NiCl₂(TMPDA), and b) H₂S pulse length, and c) deposition temperature. The somewhat atypical saturation characteristics are due to changes in preferred crystalline orientation. Thicknesses were measured by energy-dispersive X-ray spectrometry. The resistivity error bars represent variation in square resistance over the 5×5 cm² substrate. Unless otherwise noted, 750 cycles with 2 s NiCl₂(TMPDA) and 4 s H₂S pulses separated by 2 s N₂ purges at 165 °C were applied.

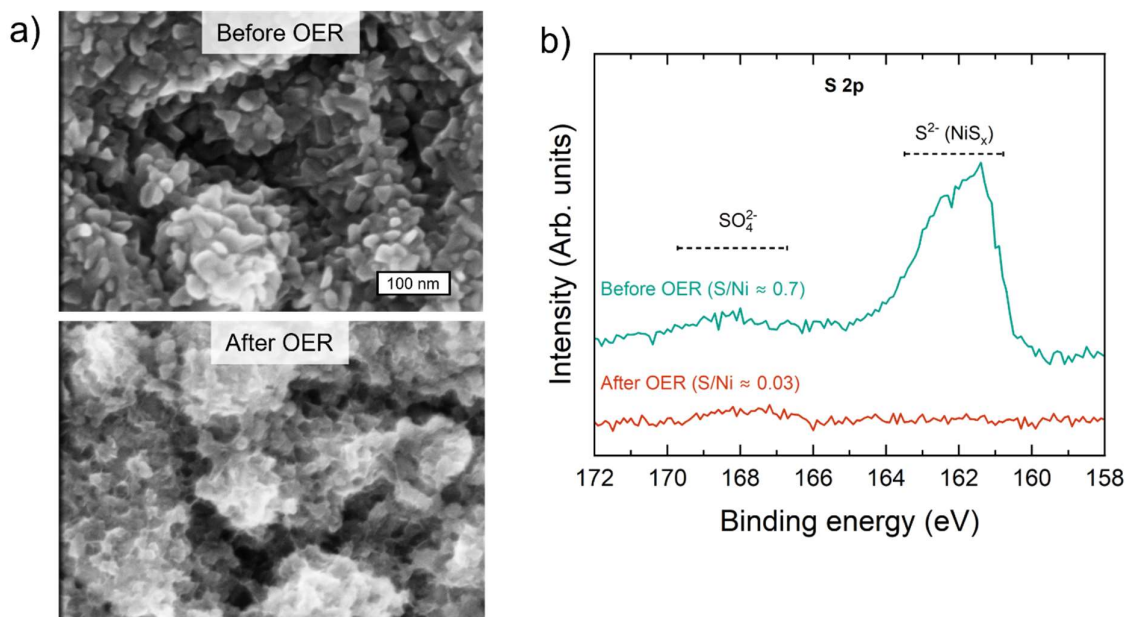


Figure 2. OER catalyst characterization: a) Scanning electron microscopy images and b) X-ray photoelectron spectra (S 2p region) of approximately 5 nm NiS_x films deposited on fluorine-doped tin dioxide before and after use as an OER catalyst for approximately 2 hours. SEM suggests the film becomes less dense and more porous after OER. Approximate S/Ni ratios as well as expected positions of S²⁻ and SO₄²⁻ components are indicated in b) to illustrate the loss of sulfur during OER (no major Ni loss was observed).