## **Supporting Information**

## Improving the oxygen evolution reaction using electronic structure modulation of sulfur-retaining nickel-based electrocatalysts

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**Figure S1.** (a) HR-TEM image of NiFeCo/C. (b) HR-TEM EDS elemental mapping images of NiFeCo/C. Green, blue, cyan, and red indicate Ni, Fe, Co and O, respectively.



Figure S2. XPS spectra of S 2p for the NiFeCo-S/C



Figure S3. XPS spectra of O 1s for the NiFeCo-S/C and NiFeCo/C



**Figure S4.** (a) Polarization curves, and (b) Tafel plots of Ni-S/C, NiFeCo-S/C, NiFe-S/C, and NiCo-S/C catalysts



Figure S5. Nyquist plots for NiFeCo-S/C, NiFeCo/C and reference catalysts.



**Figure S6.** HR-TEM image and HR-TEM EDS elemental mapping images of NiFeCo-S/C after OER tests (24 h). Green, blue, cyan, red and yellow indicate Ni, Fe, Co, O and S, respectively.



Figure S7. XPS spectra of Ni 2p for the NiFeCo-S/C and NiFeCo/C after OER tests (AO).



Figure S8. XPS spectra of S 2p for the NiFeCo-S/C after OER tests (AO).



Figure S9. XPS spectra of O 1s for the NiFeCo-S/C and NiFeCo/C after OER tests (AO).



**Figure S10.** HR-TEM image and HR-TEM EDS elemental mapping images of NiFeCo-S/C after OER tests. Green, blue, cyan, red and yellow indicate Ni, Fe, Co, O and S, respectively.



**Figure S11.** IL HR-TEM image and HR-TEM EDS elemental mapping images of NiFeCo-S/C before OER tests. Green, blue, cyan, red and yellow indicate Ni, Fe, Co, O and S, respectively.



**Figure S12.** IL HR-TEM image and HR-TEM EDS elemental mapping images of NiFeCo-S/C after OER tests. Green, blue, cyan, red and yellow indicate Ni, Fe, Co, O and S, respectively.