

Effect of Co Doping on Electrocatalytic Performance of Co-NiS₂/CoS₂ Heterostructures

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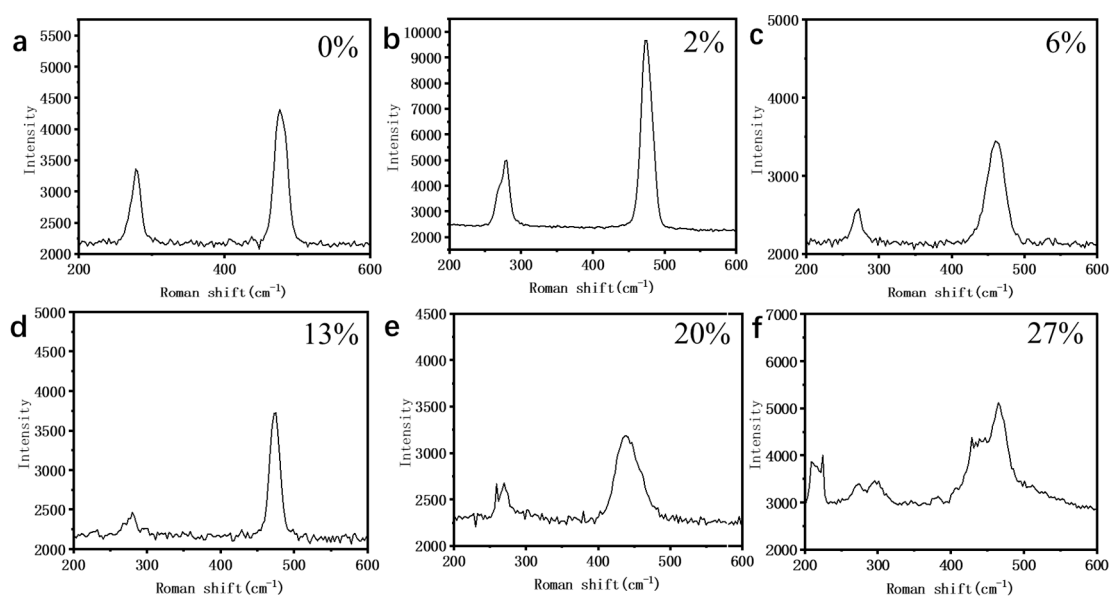


Figure S1. Raman spectra of Co doped Co-NiS₂/CoS₂ heterostructures with a-f ratios of 0%, 2%, 6%, 13%, 20% and 27%, respectively

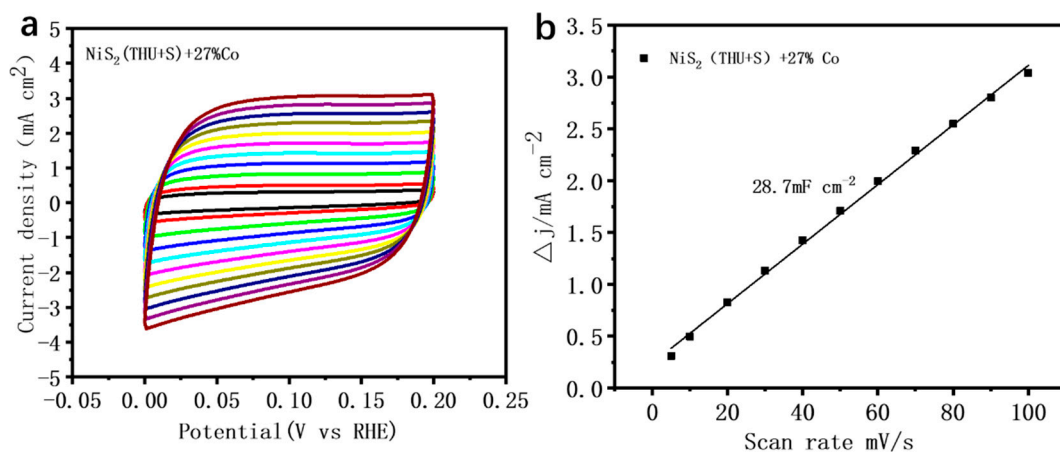


Figure S2. (a)Cyclic voltammograms of 27% Co doped Co-NiS₂/CoS₂ heterostructures at different scan rates;
(b) Calculation of the relationship between scanning rate and 27% Co doped Co-NiS₂/CoS₂ heterostructures in double-layer capacitor by linear fitting of capacitive current

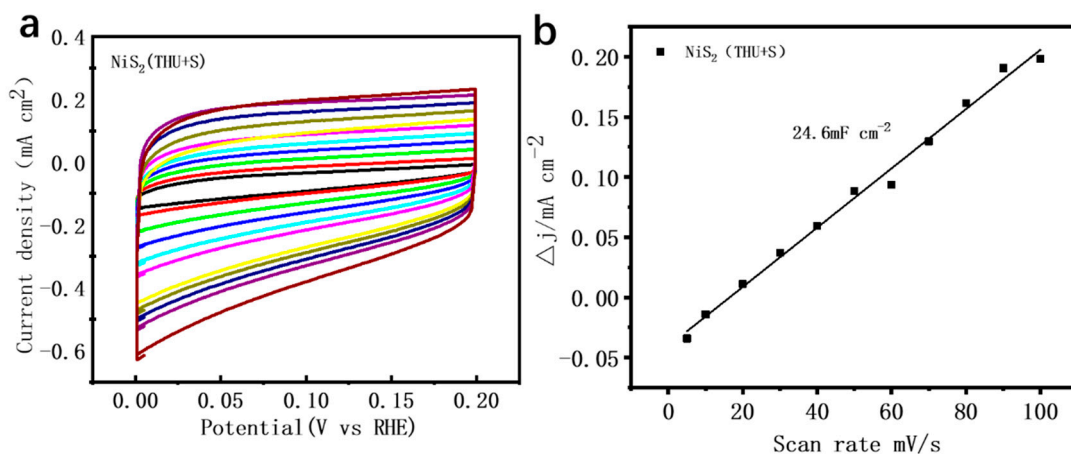


Figure S3. (a)Cyclic voltammograms of 0% Co doped Co-NiS₂/CoS₂ heterostructures at different scan rates;(b) Calculation of the relationship between scanning rate and 0% Co doped Co-NiS₂/CoS₂ heterostructures in double-layer capacitor by linear fitting of capacitive current

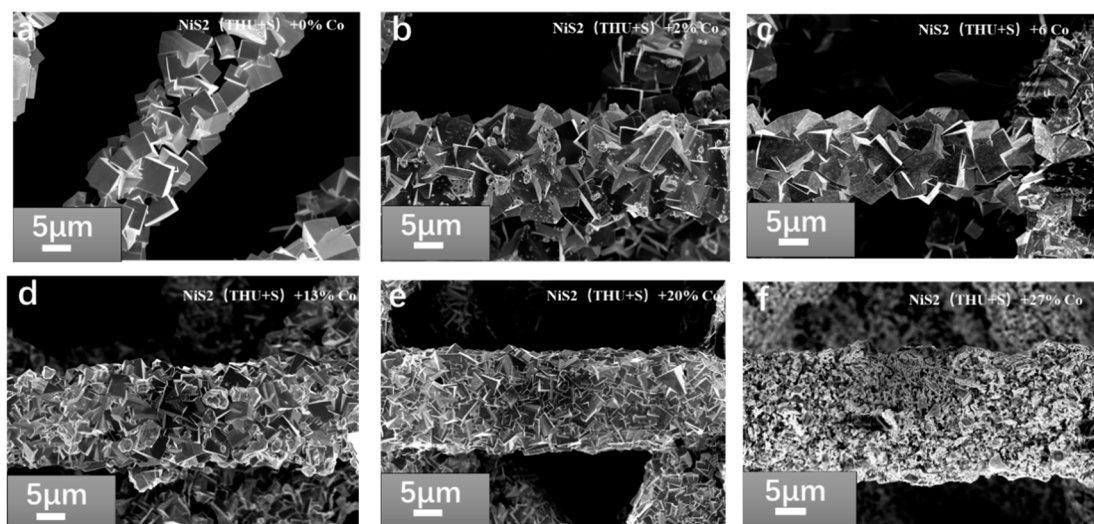


Figure S4. SEM spectra of Co doped Co-NiS₂/CoS₂ heterostructures with a-f ratio of 0%, 2%, 6%, 13%, 20% and 27%, respectively

Table S1. The comparison of electrocatalytic performance of the latest and related research.

Catalyst	Test solution	Overpotential (10mAcm ⁻²)	Tefel slope (mV·dec ⁻¹)	Stability
CoSe@NCNT/NCN[3 7]	0.5M H ₂ SO ₄	197mV	43	
FeS nanosheets[4]			36.9	
Co-NiS ₂ /CoS ₂	0.5M H ₂ SO ₄	133mV	123	800CV
MoS ₂ [S1]	1 M KOH	234 mV		
Mo ₂ C@CN[S2]	0.5M H ₂ SO ₄	202 mV	69	2000 cycles in the acid media
CoNiP/NCNTs[S3]	0.5M H ₂ SO ₄	75mV		

References

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- S2. Li, Yang., Huang, Qilin., Wu, Hongbiao., Cai, Lun., Du, Yiming., Liu, Shiqiu., Sheng, Zongqiang., Wu, Mingzai. N-doped Mo₂C nanoblock for efficient hydrogen evolution reaction [J]. *Journal of Solid State Electrochemistry*, **2019**, 23, 1-8, doi: 10.1007/s10008-019-04302-9.
- S3. Xia, J., Li, S. M., Gao, S., Xie, S., Liu, H. Preparation of cobalt-based nanomaterials carried by nitrogen-doped carbon nanotubes as high performance electrocatalysts for hydrogen evolution reaction. *New Carbon Materials*, **2020**, 35, 87-96, doi: 10.1016/S1872-5805(20)60477-2.