

Supporting Information

Cobalt manganese sulfide nanosheets: A Robust bifunctional catalyst for alkaline water electrolysis

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1. Electrochemical analysis- ECSA:

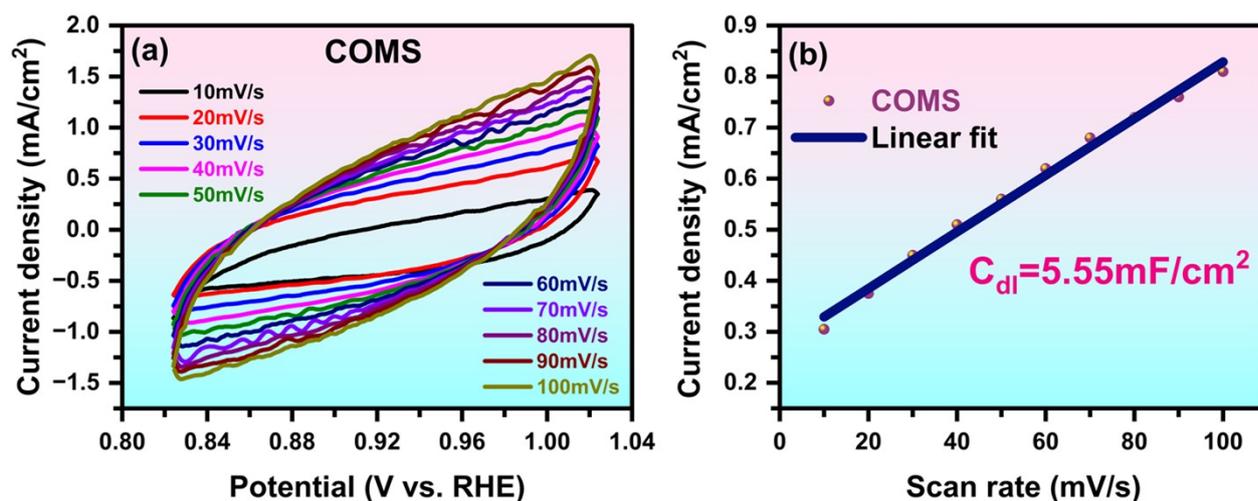


Fig. S1 (a) CV curves at different scan rates for C_{dl} determination and (b) linear fit from CV curves (scan rate vs. current density).

2. Post stability analysis-HR-SEM:

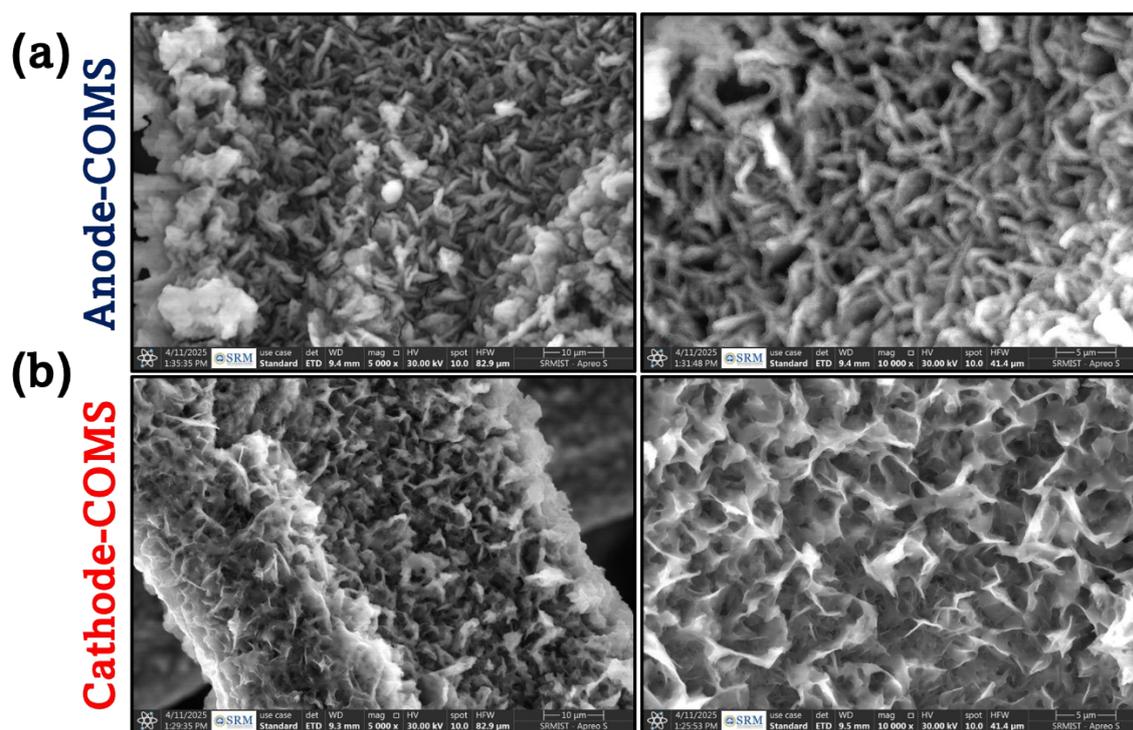


Fig. S2 Post stability analysis of COMS electrocatalysts (a) Anode, and (b) Cathode.

Table. S1 Comparison of the COMS electrocatalyst with previously reported literature:

Catalyst	Electrolyte	Overall potential (V) @ 10 mA/cm ²	Stability (hours)	Reference
COMS	1M KOH	1.54	300	This work
NiFeS	1M KOH	1.625	14	1
CoMoS ₄	1M KOH	1.72	12	2
Ni ₃ S ₂ /MoS ₂	1M KOH	1.79	15	3
Co-MoS ₂	1M KOH	1.90	11	4

CoS₂/GF	1M KOH	1.74	18	5
Co-S/G	1M KOH	1.77	10	6
Ni-Mo-S	1M KOH	2	12	7
Mo-NiS	1M KOH	1.92	18	8
Cu₂S-Ni₃S₂	1M KOH	1.77	100	9
Sr₂FeNbO₆	1M KOH	1.76	15	10
Ni₂Co-LDHs	1M KOH	1.75	60	11
NiSe₂-MoSe₂	1M KOH	1.54	50	12
P-rGo-MoSe₂- MnSnO₃	1M KOH	1.54	82	13
Cobalt-doped WSe₂	1M KOH	1.87	22	14
NiSe₂- MoSe₂/CC	1M KOH	1.59	40	15
V-doped MoS₂	1M KOH	2.2	-	16

3. BET experimental conditions:

Sample Weight	0.0922 g
Instrument	Autosorb iQ Station 1
Approx. Outgas Time	2.2 hrs
Final Outgas Temp	150 °
Analysis gas	Nitrogen
Analysis Time	5:58 hr:min
Temperature	77.350K
Cross Section:	16.200 Å ²
Liquid Density:	0.808 g/cc

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