Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supporting Information

Core@Shell Hollow Heterostructure of Co_3O_4 and Co_3S_4: An Efficient Oxygen Evolution Catalyst

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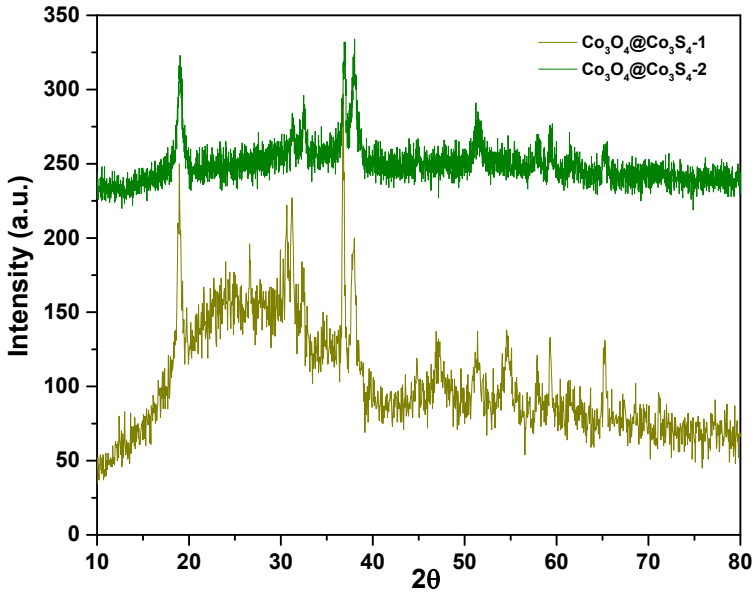

Fig. S1: XRD pattern of Co_3O_4@Co_3S_4-1 and Co_3O_4@Co_3S_4-2 sheets.

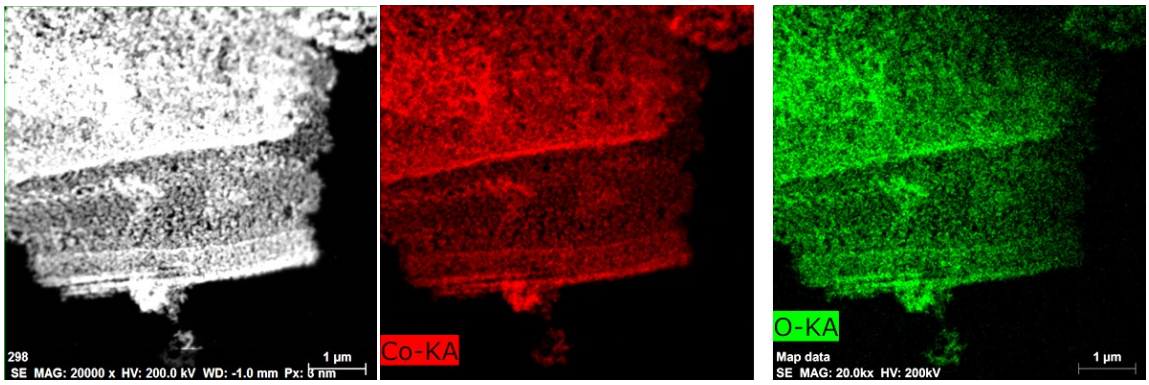

Fig. S2: EDS area mapping of Co_3O_4 sheets showing the uniform distribution of Co and O.

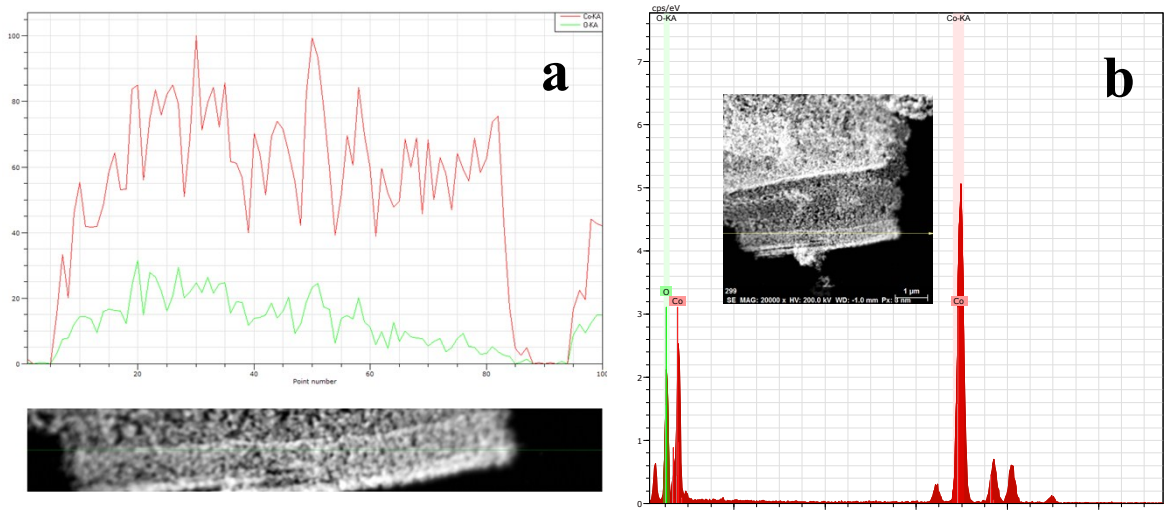

Fig. S3: (a) EDS line mapping shows comparative distribution of Co and O and (b) EDS spectrum indicting the presence of Co and O in Co_3O_4 sheets.

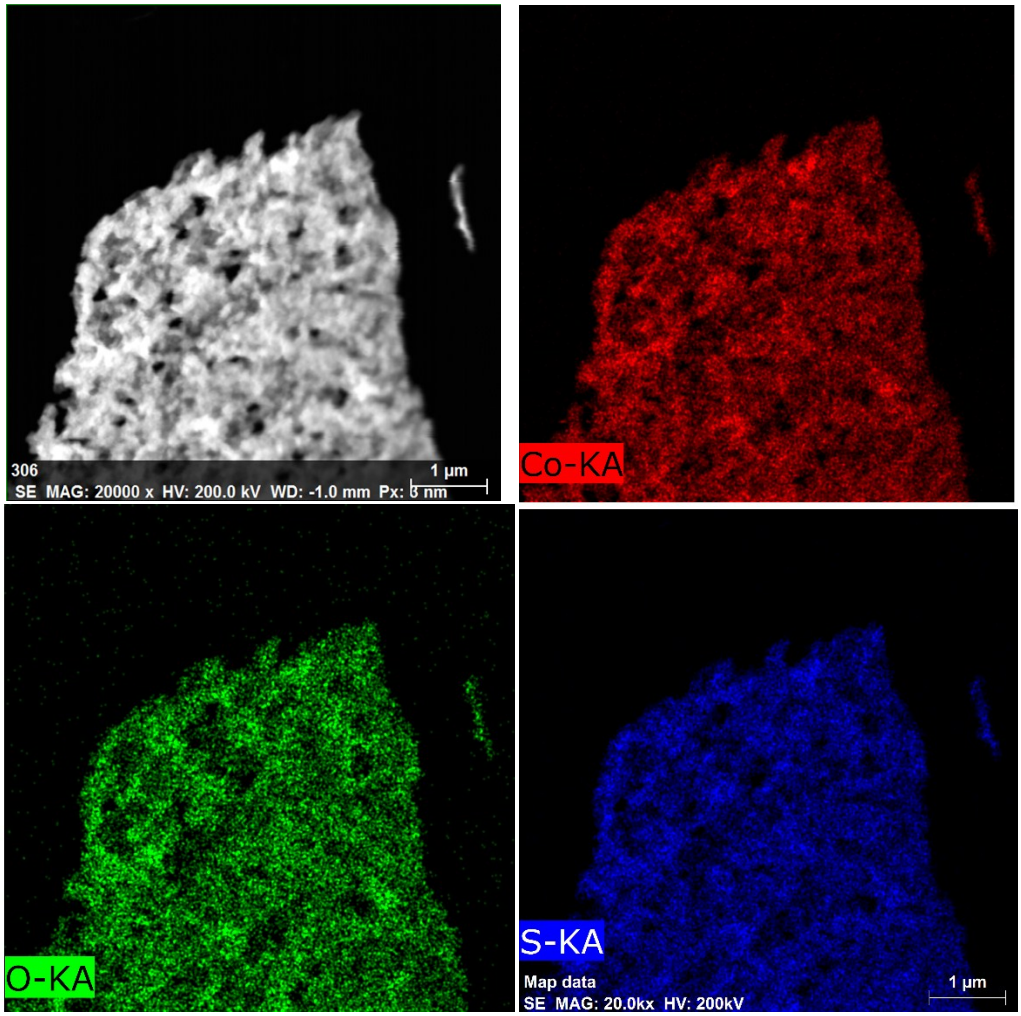

Fig. S4: EDS area mapping of Co_3O_4@Co_3S_4-2 sheets showing the uniform distribution of Co, O and S.

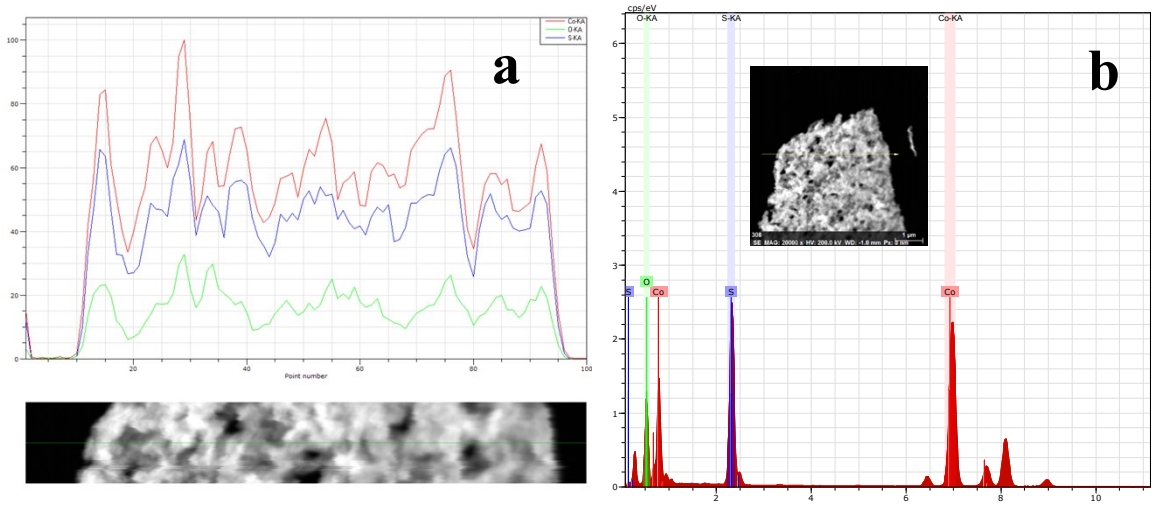

Fig. S5: (a) EDS line mapping shows comparative distribution of Co, S and O and (b) EDS spectrum indicating the signal of Co, S and O in Co_3O_4@Co_3S_4-2 sheets.

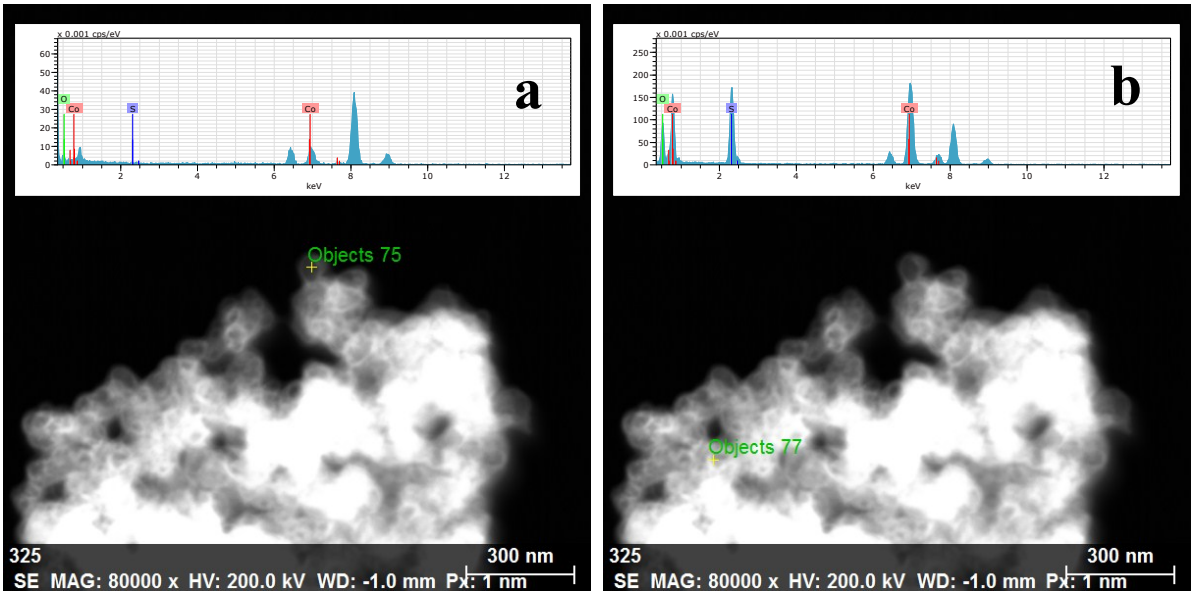

Fig. S6: ESD point mapping image taken in different points (a) at the centre of a particle, (b) at the periphery, showing hollow core@shell structure of Co_3O_4@Co_3S_4.

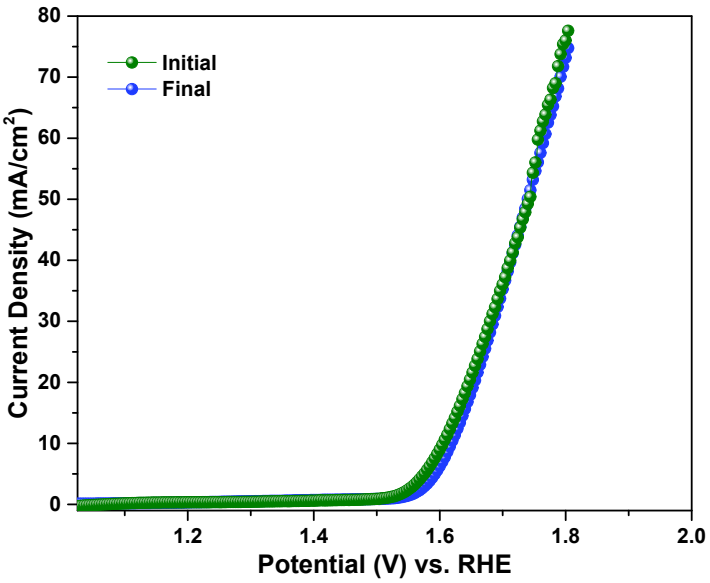

Fig. S7: Stability of Co_3O_4@Co_3S_4-2 via consecutive runs up to 1000 cycles.

Table S1: Data Comparison for electrocatalytic activity of different reported catalysts, closely relating to the present work.

S.N.	Electrocatalyst	Electrode reaction	Electrolyte	Potential (RHE) at 10 mA/cm^2 Current	Tafel slope	Substrate	Reference
1	$Co_{1-x}S$– Graphene Hybrid	ORR	0.1 M KOH	3.8 at 0.7 V	-	GC	17
2	Co_3O_4@Co_3S_4 nanoarrays	OER and HER	1 M KOH	1.53 V	-	Ni-Foam	22
3	$NiCo_2S_4$@N/S-rGO	OER	0.1 M KOH	0.47 V	-	GC	R1
4	CoO_x@CN	OER	1 M KOH	0.26 V	115	GC	R2
5	Co_3O_4C-NA	OER	0.1 M KOH	1.52 V	70	Cu-foil	R3
6	$Mn_3O_4/CoSe_2$	OER	0.1 M KOH	0.45 V	49	GC	R4
7	Co_3O_4/N-doped-graphene	OER	1 M KOH	1.54 V	67	Ni-foam	13
8	N-doped graphene-CoO	OER	1 M KOH	1.57 V	71	GC	R5
9	CeO_2 /$CoSe_2$	OER	0.1 M KOH	0.288 V	44	GC	R6
10	WS_2/WO_2	HER	0.5 M H_2SO_4	-90 mV	63	GC	19
11	MoS_2/MoO_2	HER	0.5 M H_2SO_4	-120 mV	51	GC	19
12	Co_3O_4@Ni_3S_2/NF composite	OER	1 M KOH	260@20 mA /cm^2	171	Ni-foam	45
13	Co_3O_4@Co_3S_4	OER	0.5 M KOH	1.606 V	80	GC	This work

References:

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