

Supporting Information file

Morphologically Controlled Rapid Fabrication of Rhodium Sulfide (Rh_2S_3) Thin Films for Superior and Robust Hydrogen Evolution Reaction

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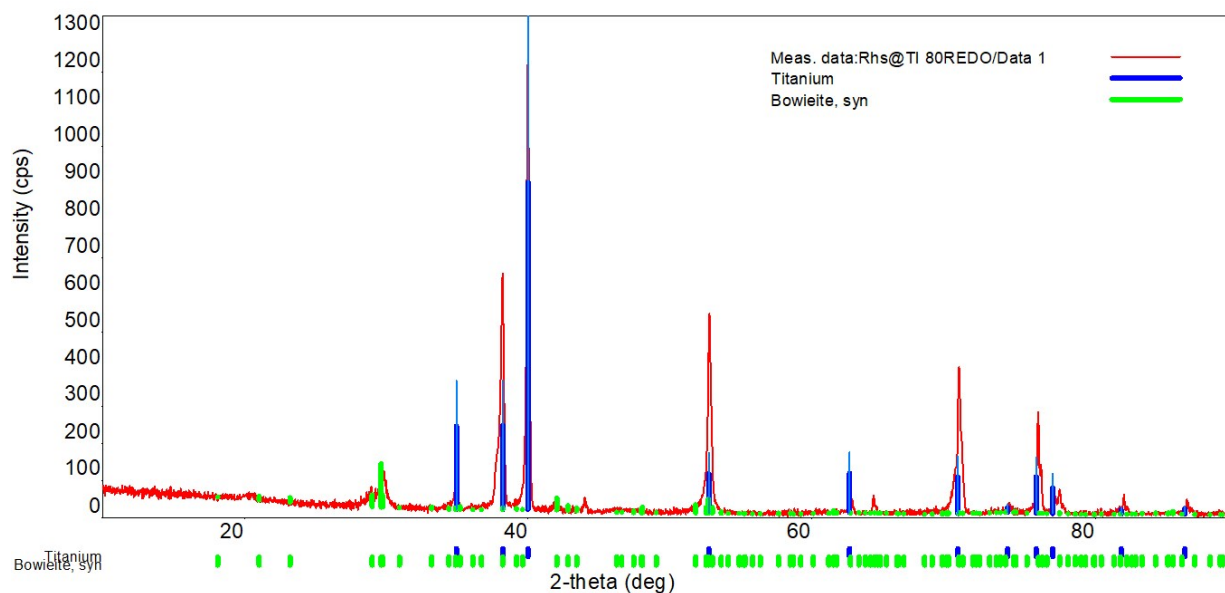


Fig. S1(a): XRD peak comparison analysis of Rh_2S_3 -80 film sample deposited on Ti-foil for 80 minute of deposition time. Red line indicates the XRD peaks of as-synthesized Rh_2S_3 -80 sample. Green bar lines indicate the standard Boweite, ((ICSD = 15344) while Blue bar lines indicate the peaks of standard Ti substrate.

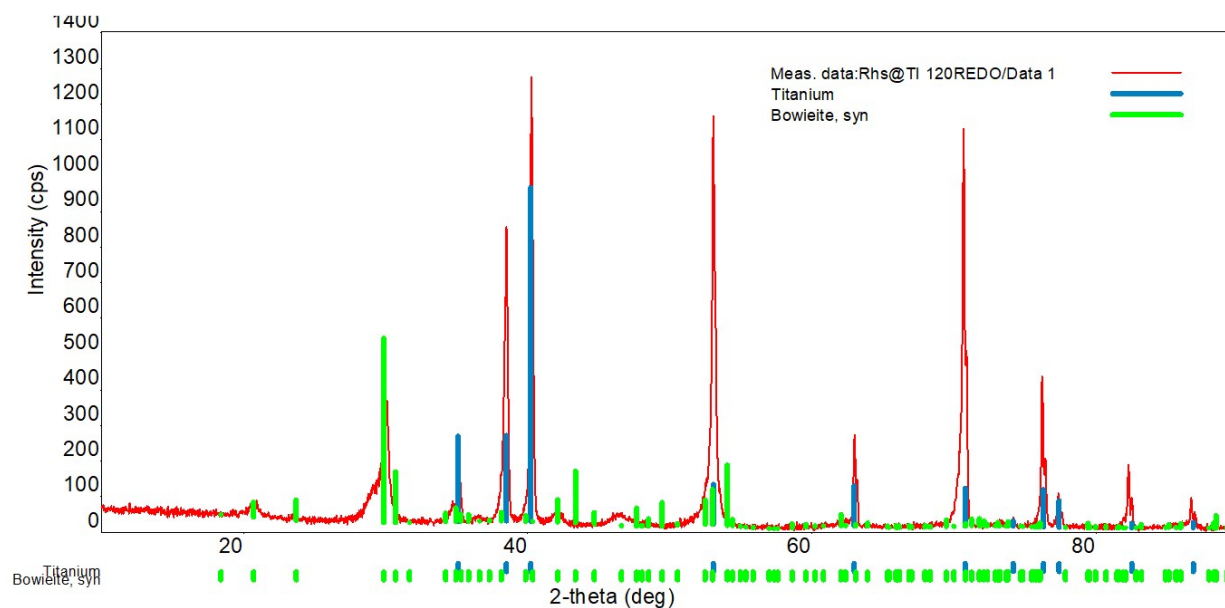


Fig. S1(b): XRD peak comparison analysis of Rh₂S₃-120 film sample deposited on Ti-foil for 120 minute of deposition time. Red line indicates the XRD peaks of as-synthesized Rh₂S₃-120 sample. Green bar lines indicate the standard Bowieite ((ICSD = 15344) while Blue bar lines indicate the peaks of standard Ti substrate .

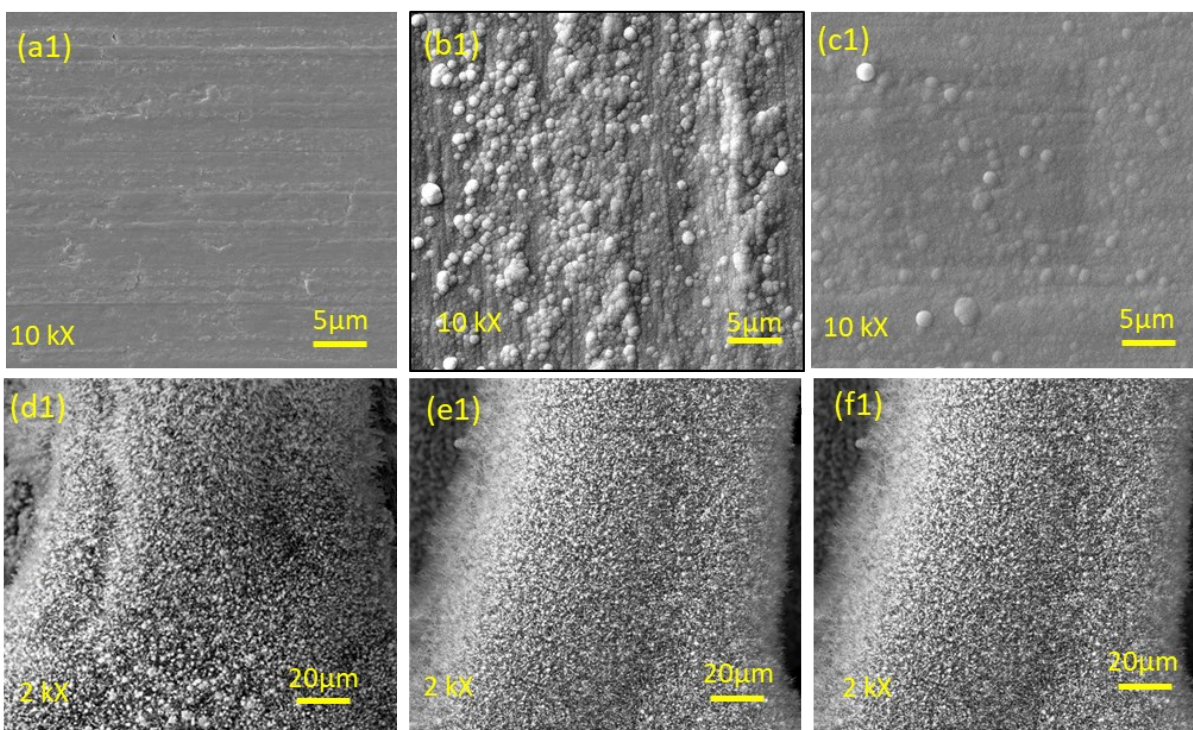


Fig. S2: Different low resolution FESEM images of the Rh₂S₃ films, taken from two different substrates (a1)-(c1) Ti foil and (d1)-(f1) Ni foam for deposition times of 40 min (a1) & (d1), 80 min (b1) & (e1) and 120 min (c1) & (f1).

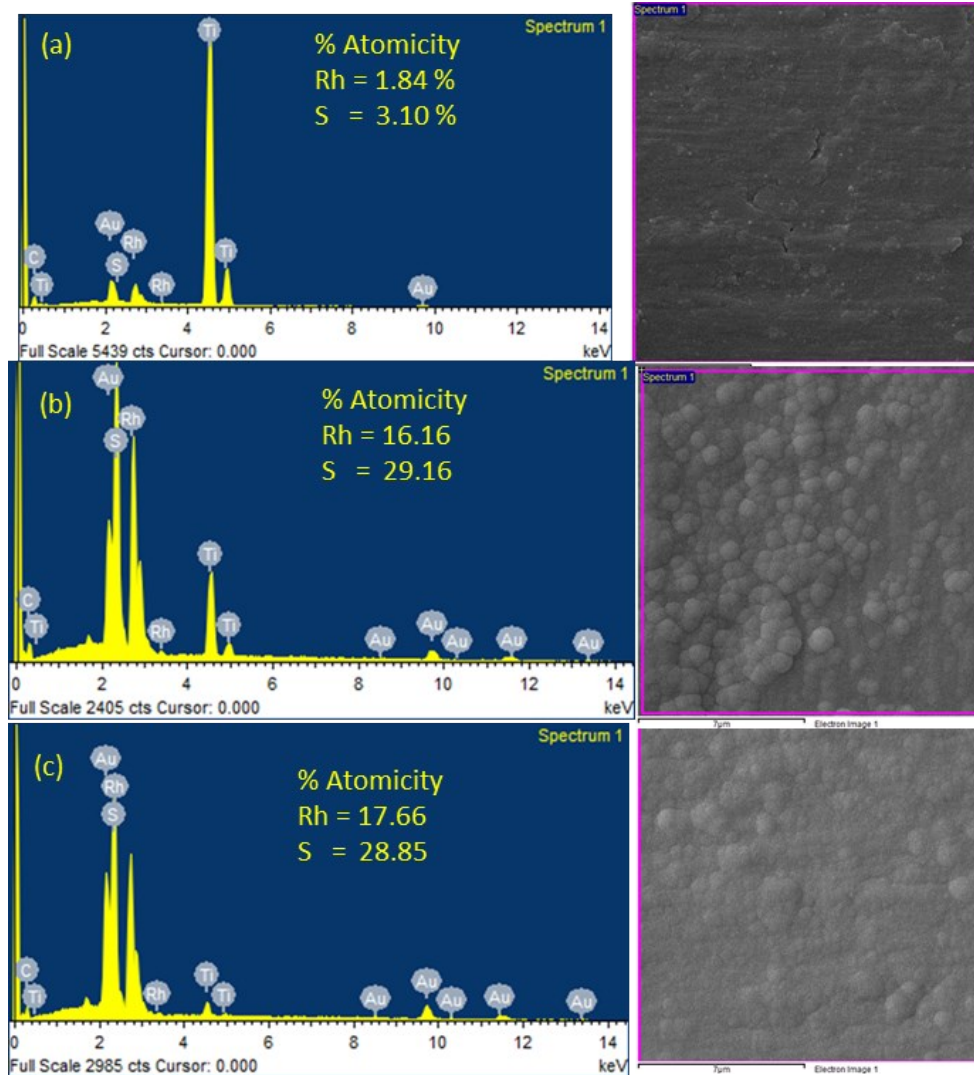


Fig. S3(a): EDX spectra of Rh_2S_3 thin films deposition on Ti foil substrate for different deposition time of (a) 40 min (b) 80 min (c) 120 min.

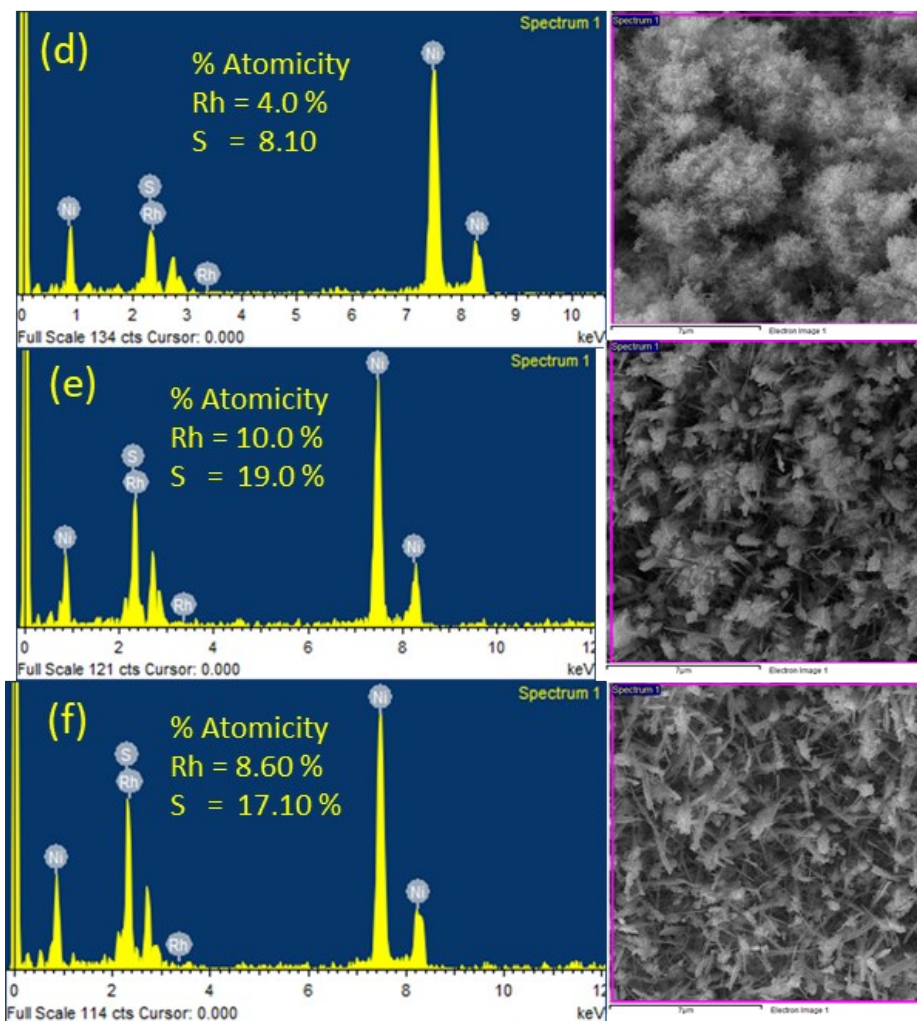


Fig. S3(b): EDX spectra of Rh_2S_3 thin films deposition on Ni foam substrate for different deposition time of (d) 40 min (e) 80 min (f) 120 min.

Table S1: Percent (%) atomic ratios of Rh/S measured from Rh₂S₃ films through EDX analysis.

Substrate type	Deposition time (minutes)	% Atomicity	
		Rh	S
	40	1.84	3.10
Ti-Foil	80	16.16	29.16
	120	17.66	28.85
Ni-Foam	40	4.0	8.10
	80	10.0	19.0
	120	8.60	17.10

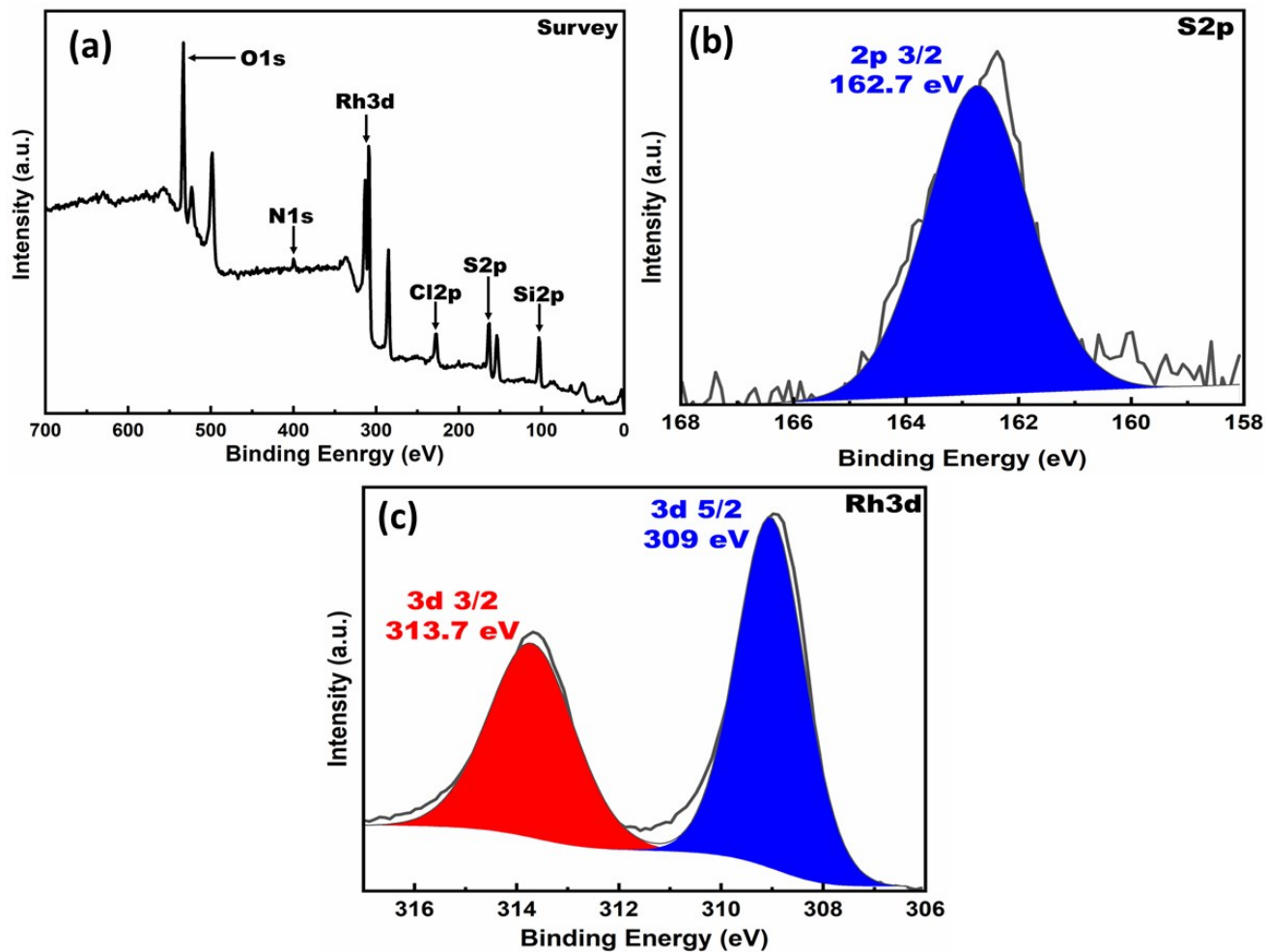


Fig. S4: XPS spectra of Rh₂S₃ thin film prepared in 120 min: (a) Survey spectrum, (b) S2p, (c) Rh3d.