Supplementary Information

Study of Simultaneous Electrodeposition of Cu and S in Choline Chloride-Ethylene Glycol Deep Eutectic Solvents: A Pathway to the Synthesis of Copper Sulfide Hexagons

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Table S1. Quantitative values of current density (J) recorded at different potentials (E) at 50-80 °C for 2_EG Cu-S bath and 3_EG Cu-S bath.

2_EG Cu-S bath			
Temperature, °C	**J, mA cm^{-2}**		**|ΔJ|, mA cm^{-2}**
	E = -1.70 V	**E = -1.80 V**	
50	-1.07	-1.91	0.84
60	-1.45	-2.74	1.29
70	-2.08	-4.38	2.30
80	-3.32	-6.45	3.13
3_EG Cu-S bath			
Temperature, °C	**J, mA cm^{-2}**		**|ΔJ|, mA cm^{-2}**
	E = -1.70 V	**E = -1.80 V**	
50	-1.23	-2.32	1.09
60	-1.95	-3.89	1.94
70	-2.90	-6.02	3.12
80	-3.74	-8.34	4.60
2_EG Cu-S bath			
Temperature, °C	**J, mA cm^{-2}**		**|ΔJ|, mA cm^{-2}**
	E = 0.80 V	**E = 0.90 V**	
50	1.33	4.95	3.62
60	1.63	4.52	2.89
70	2.85	9.73	6.88
80	3.92	12.48	8.56
3_EG Cu-S bath			
Temperature, °C	**J, mA cm^{-2}**		**|ΔJ|, mA cm^{-2}**
	E = 0.80 V	**E = 0.90 V**	
50	1.17	3.75	2.58
60	2.07	6.10	4.03
70	3.00	8.51	5.51
80	4.11	11.06	6.95

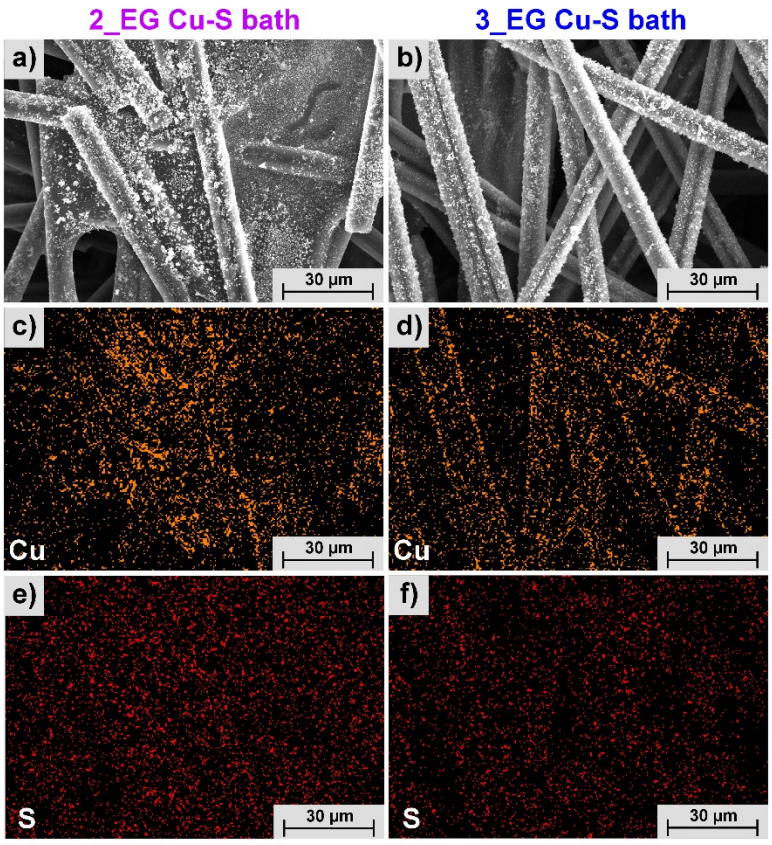

Fig. S1. a)-b) FE-SEM images, and corresponding c)-d) Cu, and e)-f) S EDS maps for samples synthesized at potential -1.33 V from the 2_EG Cu-S bath (left-hand column), and the 3_EG Cu-S bath (right-hand column).

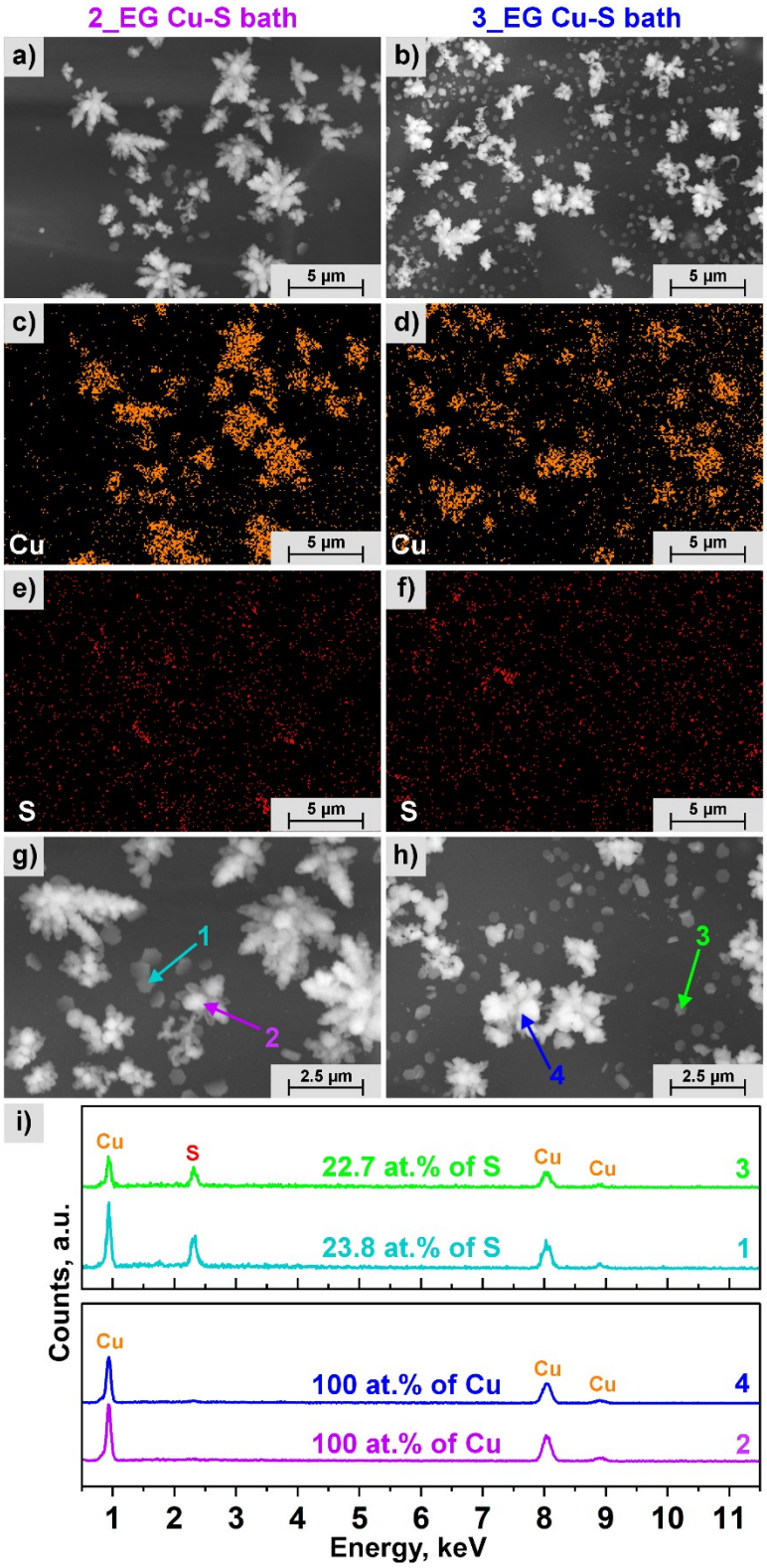

Fig. S2. a)-b) FE-SEM images, and corresponding c)-d) Cu, and e)-f) S EDS maps for samples synthesized at potential -1.09 V from 2_EG Cu-S (left-hand column) and 3_EG Cu-S (right-hand column) baths acidified with 25 mM H_2SO_4 addition. g)-h) High magnification FE-SEM images with corresponding i) EDS point analyses.

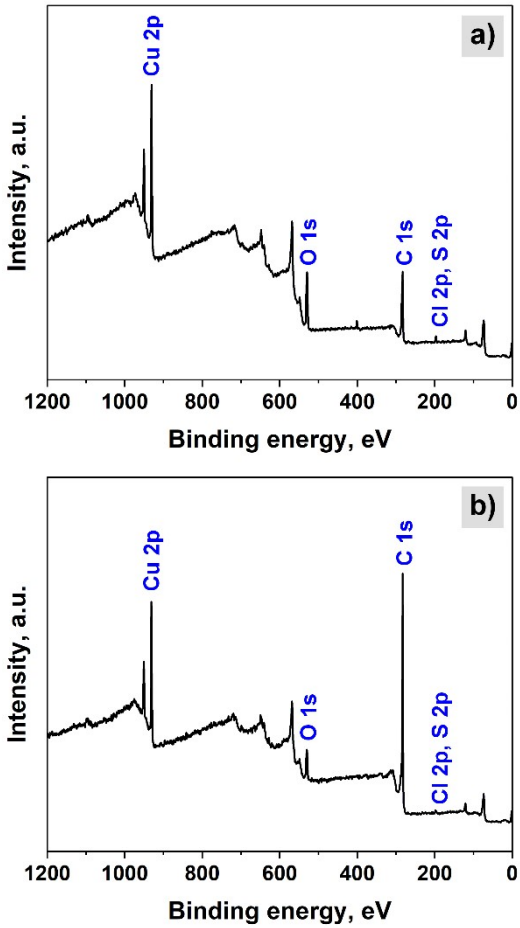

Fig. S3. XPS survey spectra for Cu-S samples synthesized at potential -1.09 V from the 3_EG Cu-S bath a) without, and b) with the addition of 50 mM H_2SO_4.

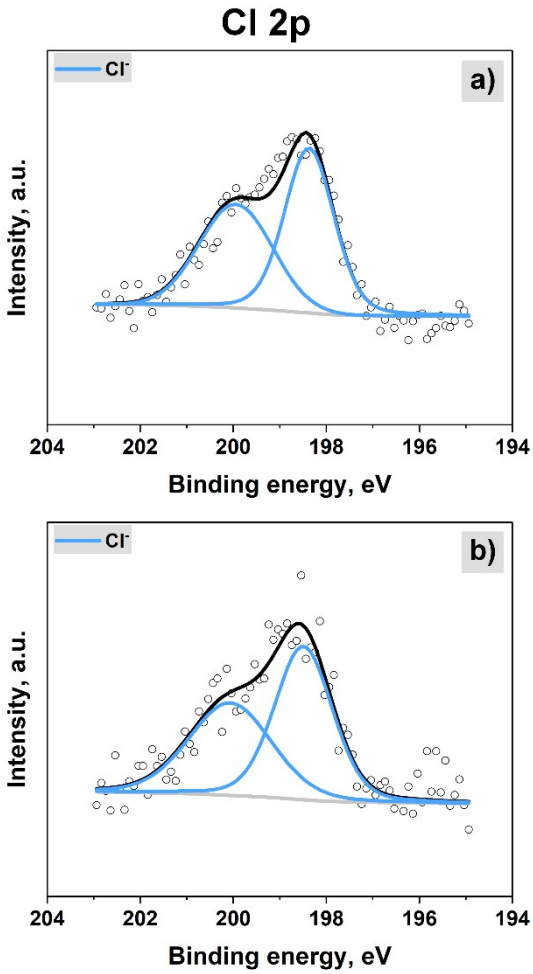

Fig. S4. High-resolution XPS spectra in Cl 2p region for Cu-S samples synthesized at potential -1.09 V from the 3_EG Cu-S bath a) without, and b) with the addition of 50 mM H_2SO_4.