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Electronic Supporting Information (ESI)

CuCo2S4-MoS2 nanocomposite: A novel electrode for high-performance supercapacitors

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 Table S1 Mass and atom percentages of elements in CuCo2S4 and CuCo2S4 -MoS2 as obtained via

 EDX and theoretical analysis.

Element	Mass (%) (Theoretical)	Mass (%) (Experimental)	Atom (%) (Theoretical)	Atom (%) (Experimental)
Cu	20.52	22.92	14.28	16.65
Со	38.06	42.09	28.57	32.97
S	41.42	35.00	57.15	50.38
Total	100	100	100	100

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Figure S1. EDX spectra of (a) CuCo₂S₄ and (b) CuCo₂S₄-MoS₂.



Figure S2. XPS survey spectrum of CuCo₂S₄-MoS₂.



Figure S3. Electrochemical behavior of MoS_2 measured in three-electrode system in aqueous electrolyte (0.5 M Na₂SO₄) within the potential range of -0.5 to 0.5 V; (a) CV curves at various scan rates and (b) GCD curves at different current densities.



Figure S4. Electrochemical behavior of $CuCo_2S_4$ measured in three-electrode system in aqueous electrolyte (0.5 M Na₂SO₄) within the potential range of -0.5 to 0.5 V; (a) CV curves at various scan rates and (b) GCD curves at different current densities.



Figure S5. Electrochemical behavior of $CuCo_2S_4$ -MoS₂ measured in three-electrode system in aqueous electrolyte (0.5 M Na₂SO₄) within the potential range of -0.5 to 0.5 V; (a) CV curves at various scan rates and (b) GCD curves at different current densities.



Figure S6. Comparison of the electrochemical behavior of physically and hydrothermally mixed $CuCo_2S_4$ -MoS₂ evaluated in three-electrode system with aqueous electrolyte (0.5 M Na₂SO₄) over the potential range from -0.5 to 0.5 V (a) CV curves at a scan rate 20mV s⁻¹; and (b) GCD curves at current density 0.5 A g⁻¹.



Figure S7. Electrochemical behavior of $CuCo_2S_4$ measured in symmetric two-electrode system in aqueous electrolyte (1 M Na₂SO₄) within the potential range of 0 to 0.7 V; (a) CV curves at various scan rates and (b) GCD curves at different current densities.



Figure S8. Electrochemical behavior of CuCo₂S₄-MoS₂ measured in symmetric two-electrode system in aqueous electrolyte (1 M Na₂SO₄) within the potential range of 0 to 0.7 V; (a) CV curves at various scan rates and (b) GCD curves at different current densities.

Sample	$R_{ m s}\left(\Omega ight)$	$R_{ m ct}(\Omega)$	Cal (µF)	$Z_{ m W}(\Omega)$	$C_{\mathrm{p}}\left(\mathrm{F} ight)$
MoS ₂	22.80	0.001	113.8	0.00216	0.01774
CuCo ₂ S ₄	35.09	29.2	0.1593	0.0044	0.0499
CuCo ₂ S ₄ -MoS ₂	9.08	9.154	0.0854	0.00264	0.00407

Table S2 Values of R_s , R_{ct} , C_{dl} , Z_W and C_p in the three-electrode system obtained by fitting withequivalent circuit.

Table S3 Values of R_s , R_{ct} , C_{dl} , Z_W and C_p in the symmetric two-electrode system obtained byfitting with equivalent circuit.

Sample	$R_{ m s}\left(\Omega ight)$	$R_{ m ct}\left(\Omega ight)$	<i>C</i> al (µ F)	$Z_{\mathrm{W}}(\Omega)$	<i>C</i> _p (F)
CuCo ₂ S ₄	99.82	70.55	0.1379	0.005009	0.02898
CuCo ₂ S ₄ -MoS ₂	50.61	46.67	0.2473	0.006939	0.02422

Table S4	Values of R_s , R_s	$_{ct,} C_{dl}$,	Z_W and C_p in the	asymmetric tw	wo-electrode	system c	obtained by
			fitting with equi	valent circuit.			

Sample	$R_{ m s}\left(\Omega ight)$	$R_{ m ct}\left(\Omega ight)$	Cal (µF)	$Z_{ m W}(\Omega)$	<i>C</i> _p (F)
CuCo ₂ S ₄ -MoS ₂	104.3	11.3	0.1514	0.02038	0.04858