

Electrochemical Characteristics of Nanosized Cu, Ni, and Zn Cobaltite Spinel Materials

1. Supplementary Figures

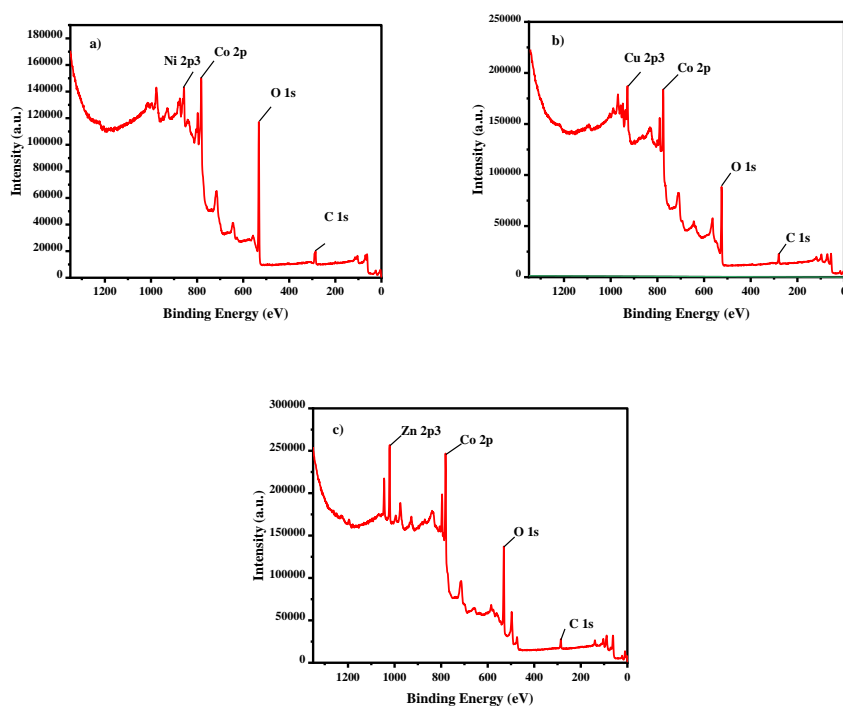


Figure S1. XPS survey spectrum of a) NiCo₂O₄, b) CuCo₂O₄, c) ZnCo₂O₄.

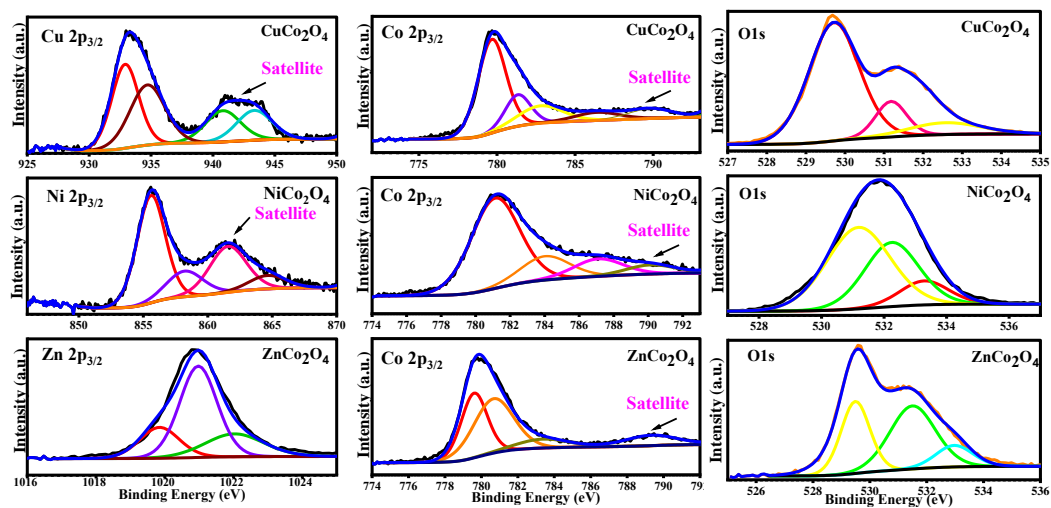


Figure S2. Deconvoluted X-ray photoelectron spectra for CuCo_2O_4 , NiCo_2O_4 and ZnCo_2O_4 before reaction.

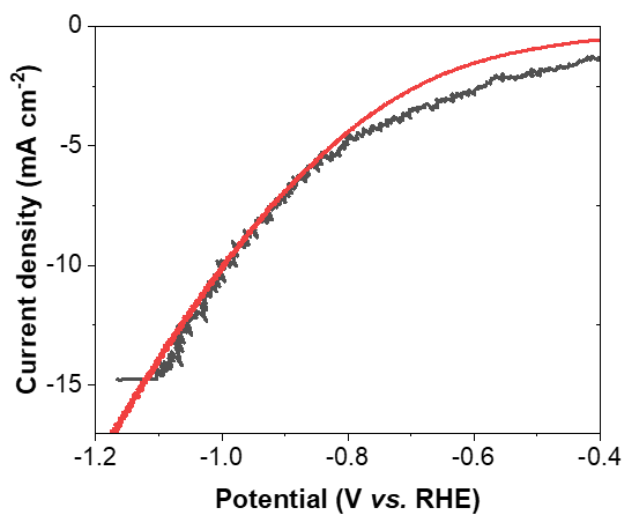


Figure S3. Ni spinel was evaluated at different times in CO₂-saturated 0.1 M KHCO₃ and reproduced independently by two different systems.

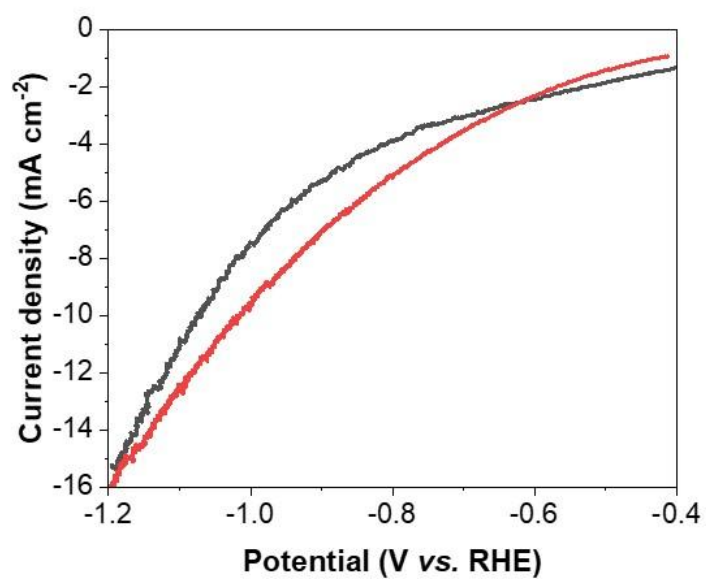


Figure S4. Cu spinel was evaluated at different times in CO₂-saturated 0.1 M KHCO₃ and reproduced independently by two different systems.

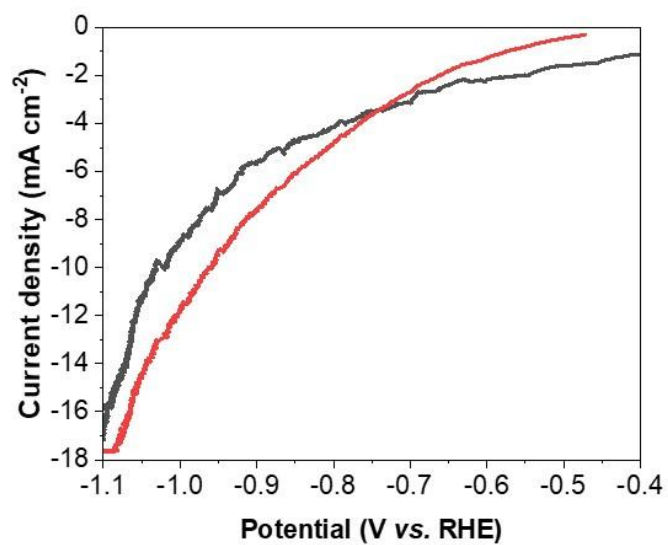


Figure S5. Zn spinel was evaluated at different times in CO₂-saturated 0.1 M KHCO₃ and reproduced independently by two different systems.

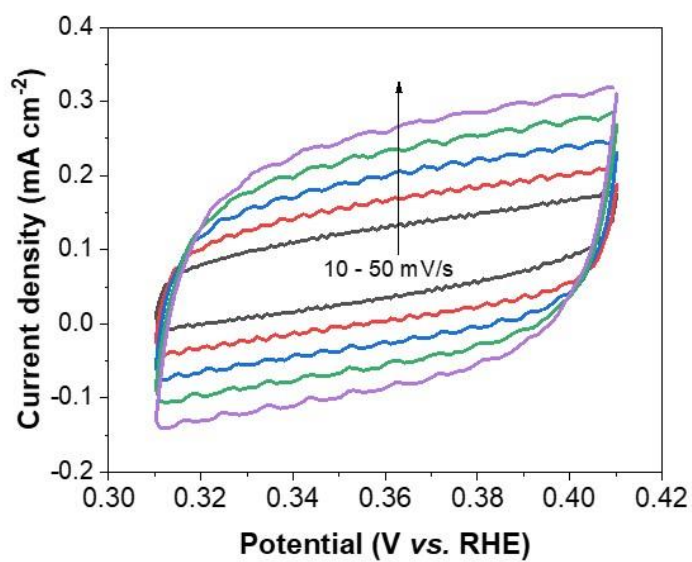


Figure S6. Cyclic voltammogram (CV) curves of Ni spinel materials in the non-Faradaic potential region recorded at different scan rates (10-50 mV s⁻¹).

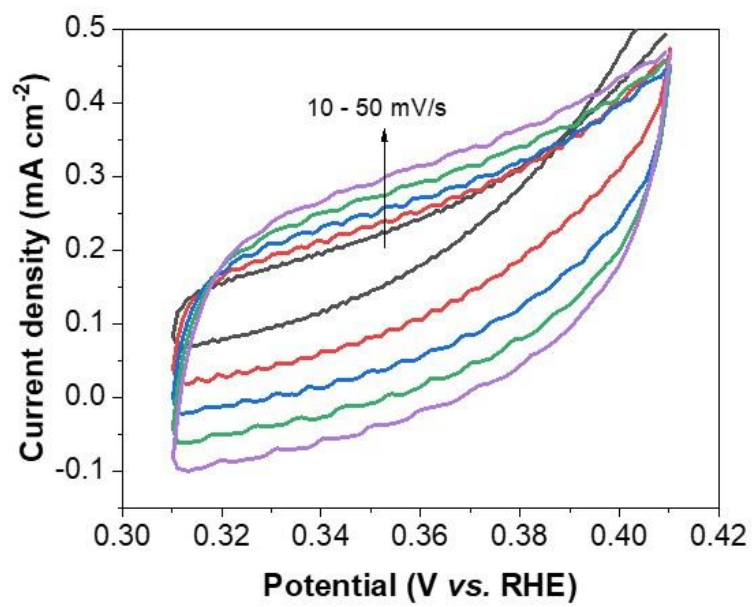


Figure S7. Cyclic voltammogram (CV) curves of Cu spinel materials in the non-Faradaic potential region recorded at different scan rates (10-50 mV s⁻¹).

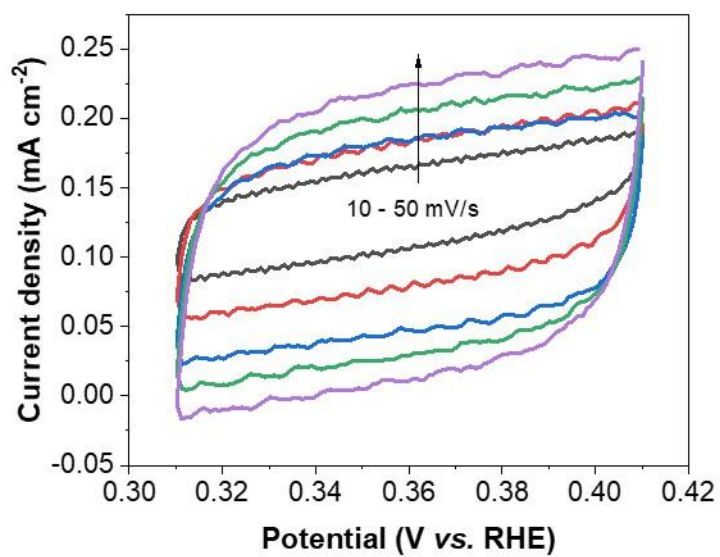


Figure S8. Cyclic voltammogram (CV) curves of Zn spinel materials in the non-Faradaic potential region recorded at different scan rates (10-50 mV s⁻¹).

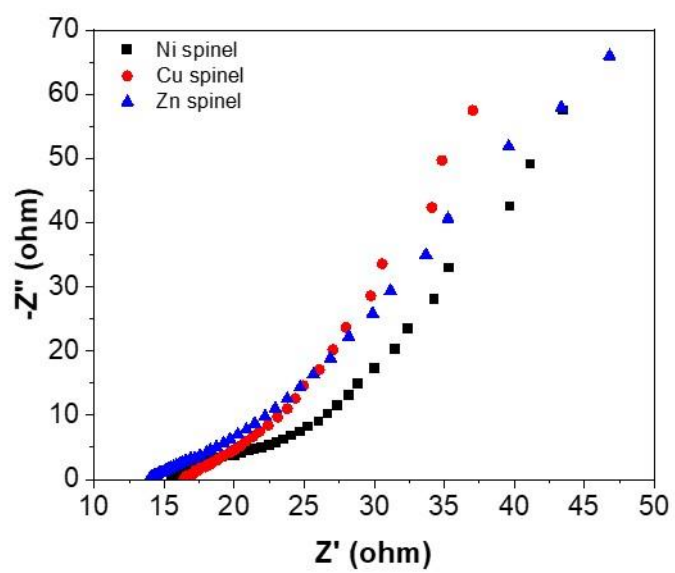


Figure S9. Nyquist plots of Ni, Zn and Cu spinel in CO₂-saturated 0.1 M KHCO₃.

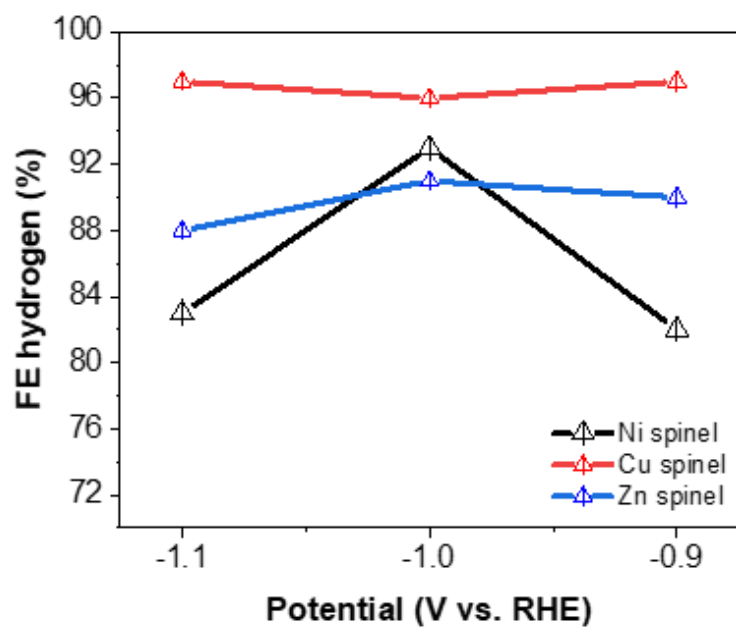


Figure S10. The FE of H₂ for the different catalysts in the potential range of -0.9 to -1.1 V.

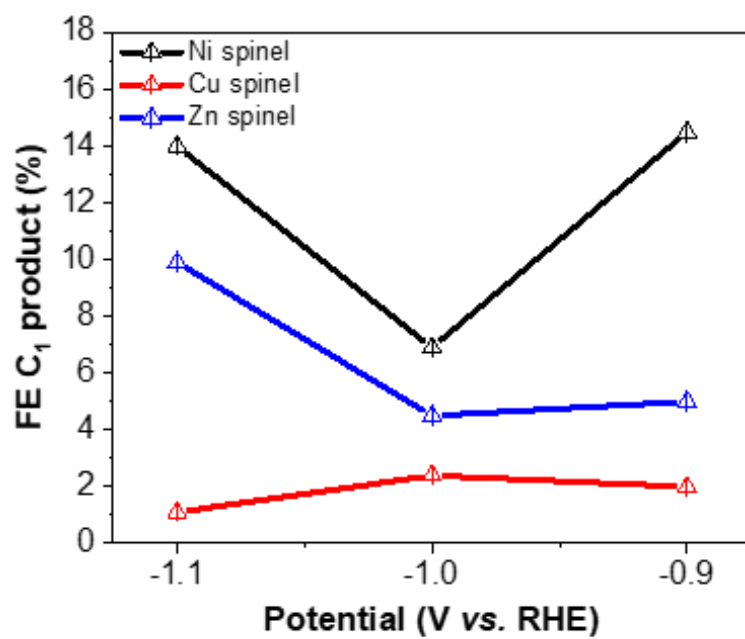


Figure S11. The FE of C₁ product for the different catalysts in the potential range of -0.9 to -1.1 V.

2. Supplementary Tables

Table S1. Summary of the electrocatalysts toward the CO₂ reduction reaction.

Catalysts	HCOOH (FE%)	CO (FE%)	MeOH (FE%)	EtOH (FE%)	Ref.
Co ₃ O ₄ -20@CNCo-20	84	-	-	-	[38]
Ultrathin Co ₃ O ₄ Layers	60	-	-	-	[39]
NGCo ₃ O ₄ -20	64			-	[30]
NGCo ₃ O ₄ -30	83	-	-	-	[30]
NGCo ₃ O ₄ -40	72			-	[30]
CuBi ₂ O ₄	60	-	-	-	[40]
CuFe ₂ O ₄ @PANI	-	-	73	-	[41]
CdSeCuFe ₂ O ₄	-	-	72	-	[42]
Ni ₂ FeS ₄	-	5.9	-	-	[43]