Optimizing the Cu^{2+} ions and the carbon-related defect centers ratio in g-C_3N_4-ZnO:Cu nanocomposites for supercapacitor applications

Ana Varadi,[a,b] Anca Silvestru,[c] Adriana Popa,[a] Dana Toloman,[a] Arpad Mihai Rostas,[a] Ameen Uddin Ammar,[a] Ion Nesterovschi,[a] Maria Mihet,[a] Sergiu Macavei,[a] Lucian Barbu-Tudoran,[a] Cristian Leostean,[a] and Maria Stefan[a,*]

[a] National Institute for Isotopic and Molecular Technologies, Donat 67-103, Cluj- Napoca, Romania
[b] Doctoral School of Chemistry, Babes, -Bolyai University, Cluj-Napoca 400084, Romania
[c] Supramolecular Organic and Organometallic Chemistry Centre (CCSOOM), Chemistry Department, Faculty of Chemistry and Chemical Engineering, "Babe¸s-Bolyai" University, 400028 Cluj-Napoca, Romania
[*] corresponding author: maria.stefan@itim-cj.r

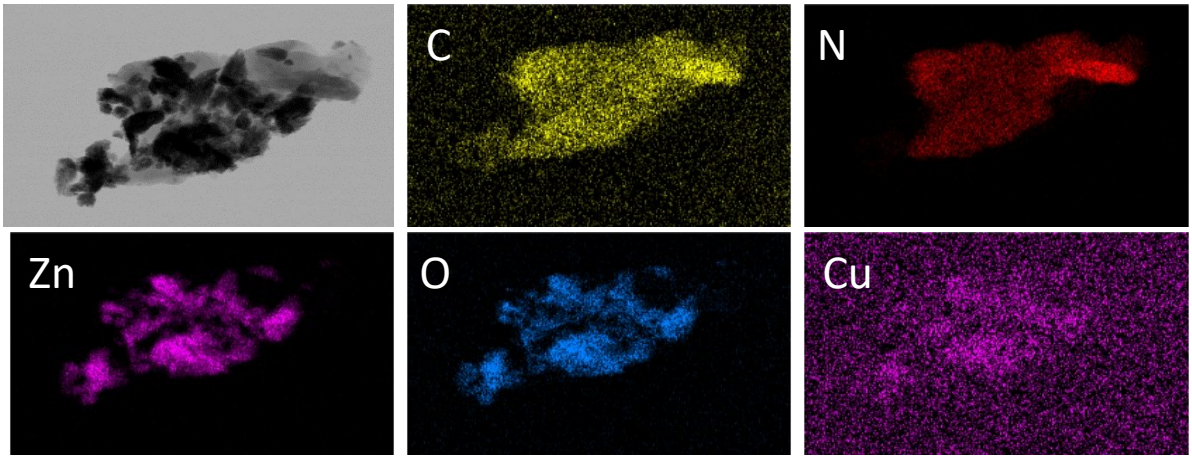

Fig S-EDS: EDS mapping measurements revealing the presence of C, N, Zn, O,m and Cu.

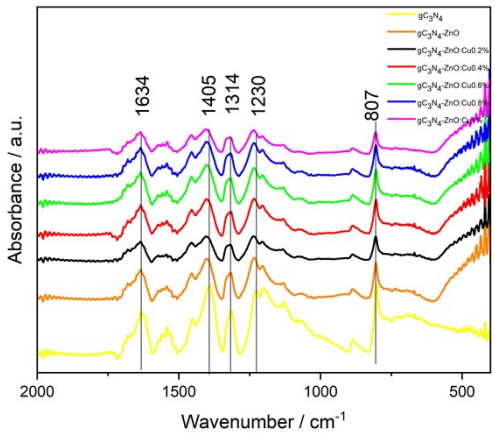

Fig S-FR-IR: FT-IR spectroscopy for the synthesized samples.

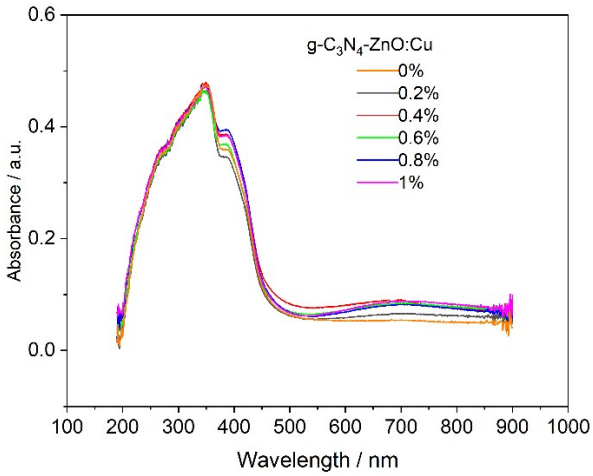

Fig S-UV-Vis: UV-Vis spectra for the synthesized composites.

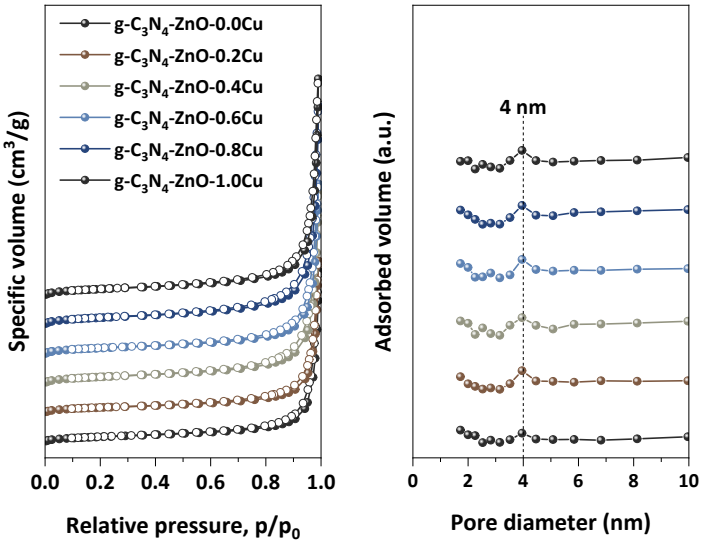

Fig S-BET: BET analysis for the synthesized composites.

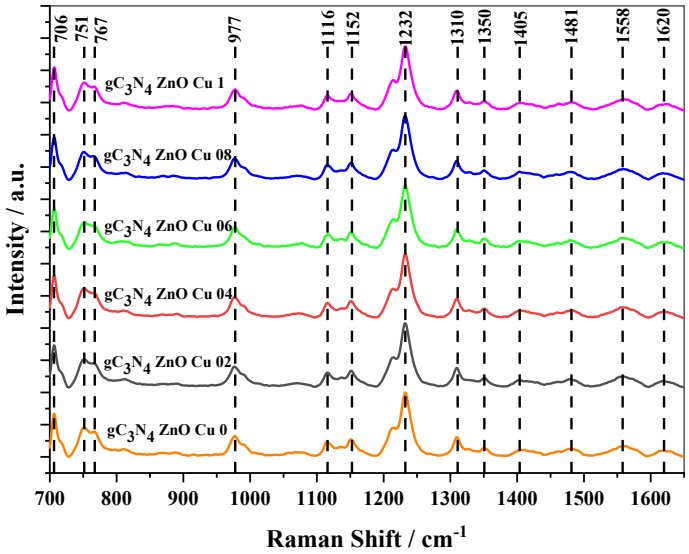

Fig S-Raman: Raman spectra for the synthesized composites.

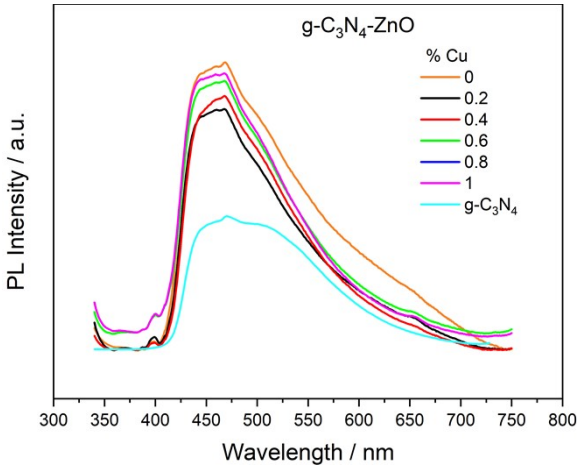

Fig S-PL: PL emission spectra recorded at 325 nm.

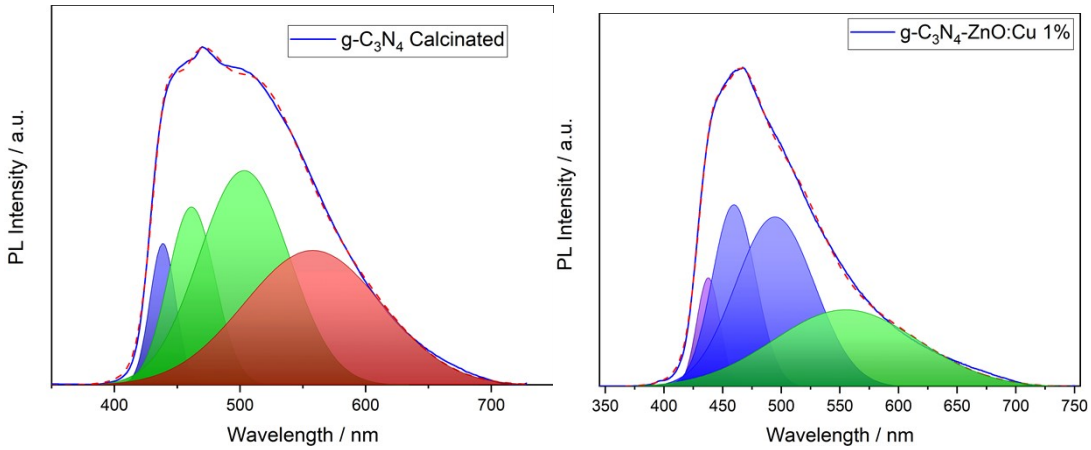

Fig S-PLdeconv: PL spectra deconvoluted for the samples: a) g-C_3N_4 calcinated and b) g-C_3N_4-ZnO:Cu 1%.

Table S-PL: The Gaussian peak fitting parameters (R^2, residual).

Sample	R^2	Residual
gC3N4-ZnO:Cu0	0.99844	1.52×10^{11}
gC3N4-ZnO:Cu0.2%	0.99825	1.19×10^{11}
gC3N4-ZnO:Cu0.4%	0.99906	0.73×10^{11}
gC3N4-ZnO:Cu0.6%	0.99919	0.63×10^{11}
gC3N4-ZnO:Cu0.8%	0.99847	1.29×10^{11}
gC3N4-ZnO:Cu1.0%	0.99948	0.20×10^{11}

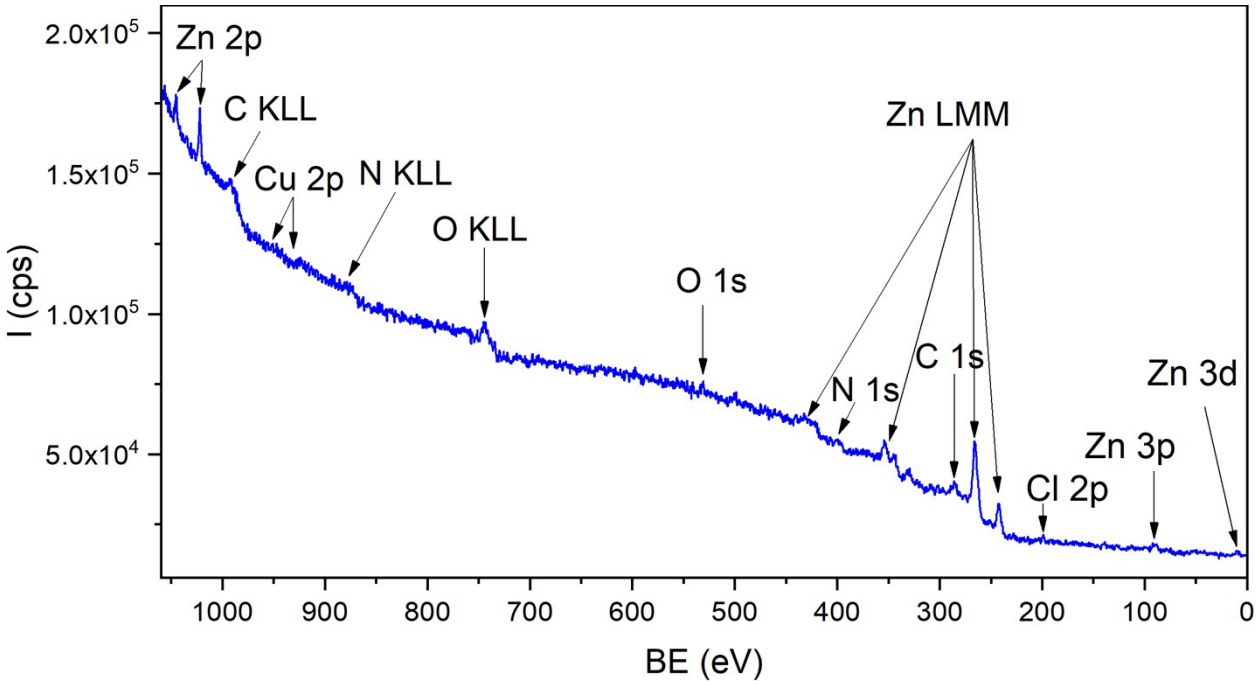

Figure S- XPS: XPS survey spectrum corresponding to g-C_3N_4-ZnO:Cu0.8 sample.

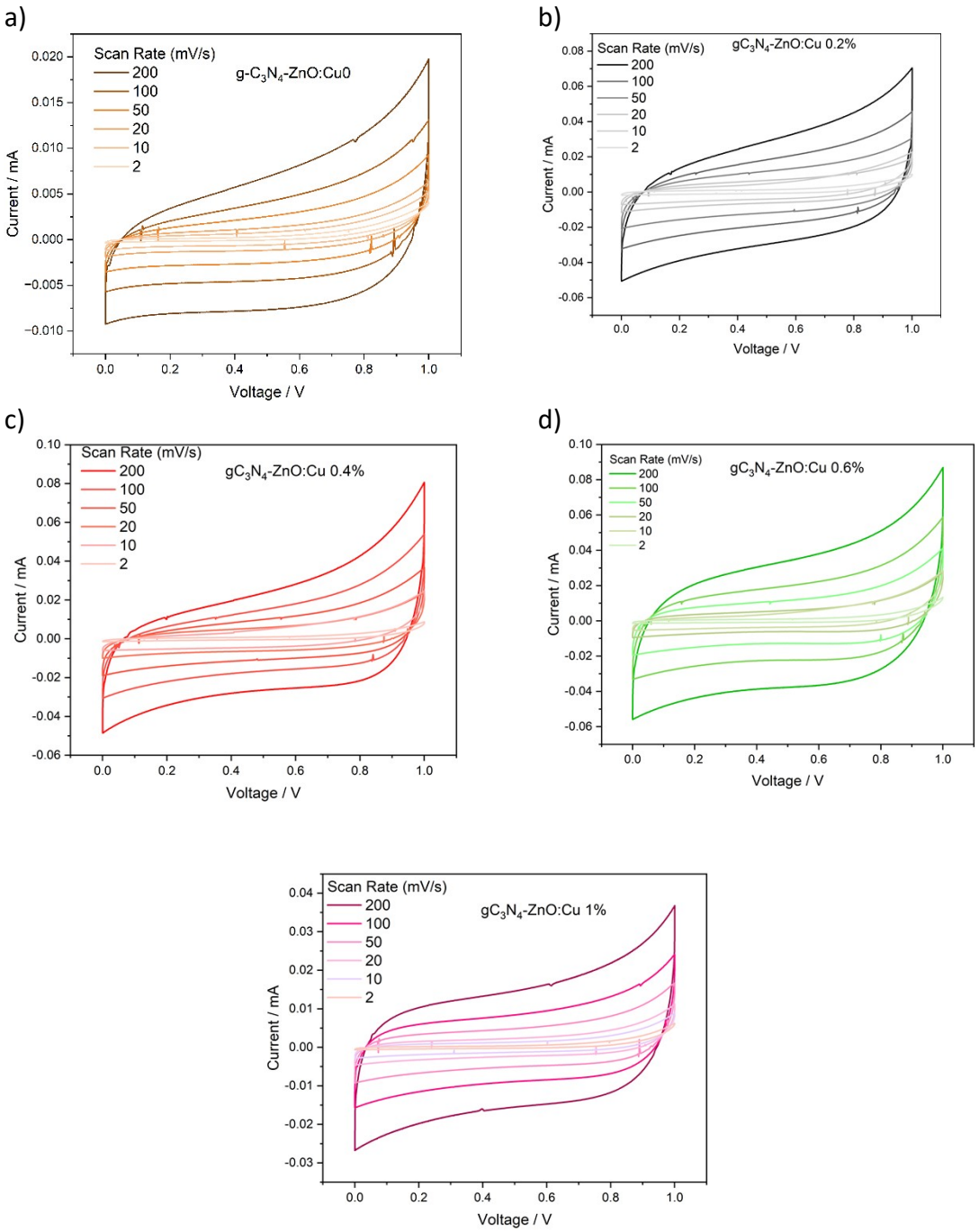

Fig S-CV: Different Scan rate CV curve for g-C_3N_4 -ZnO: Cu based supercapacitor devices.

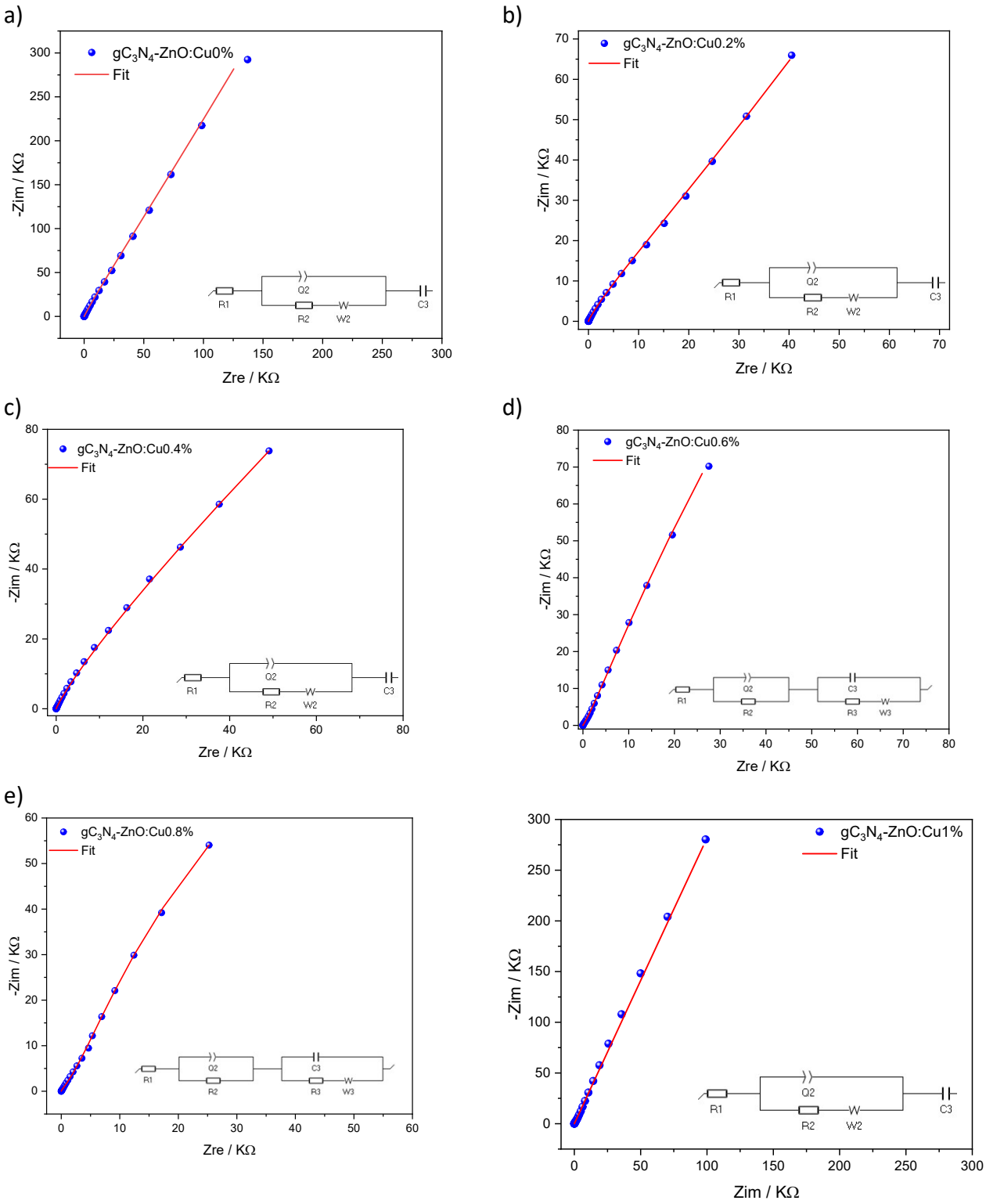

Fig S-PEIS: Zfit graphs along with the equivalent circuit for g-C_3N_4 -ZnO: Cu based supercapacitor design

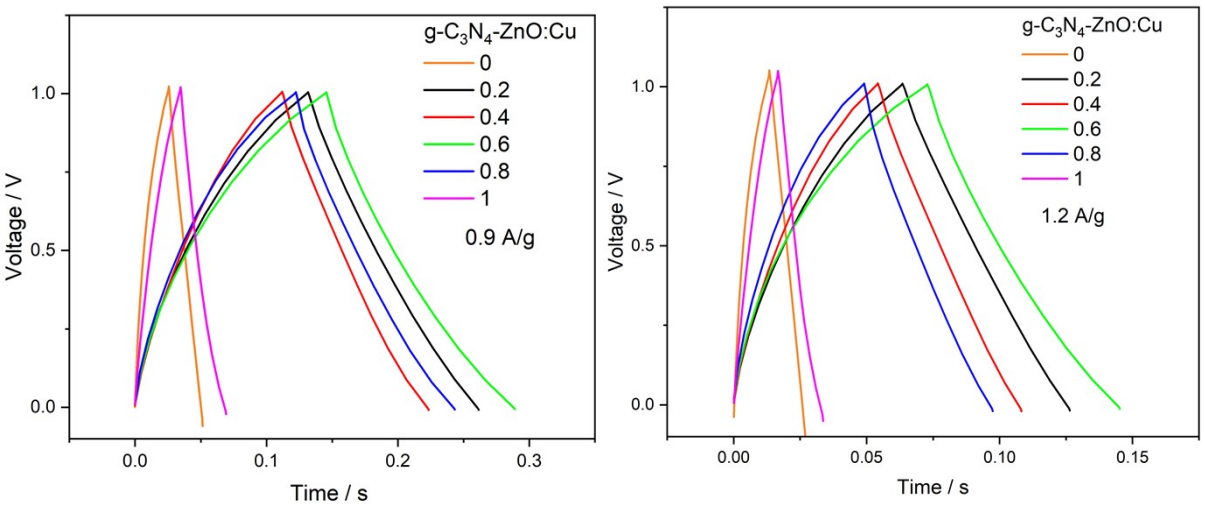

Fig S-GCD: Galvanostatic charge-discharge curve at different current densities for g-C_3N_4 -ZnO: Cu based supercapacitor design

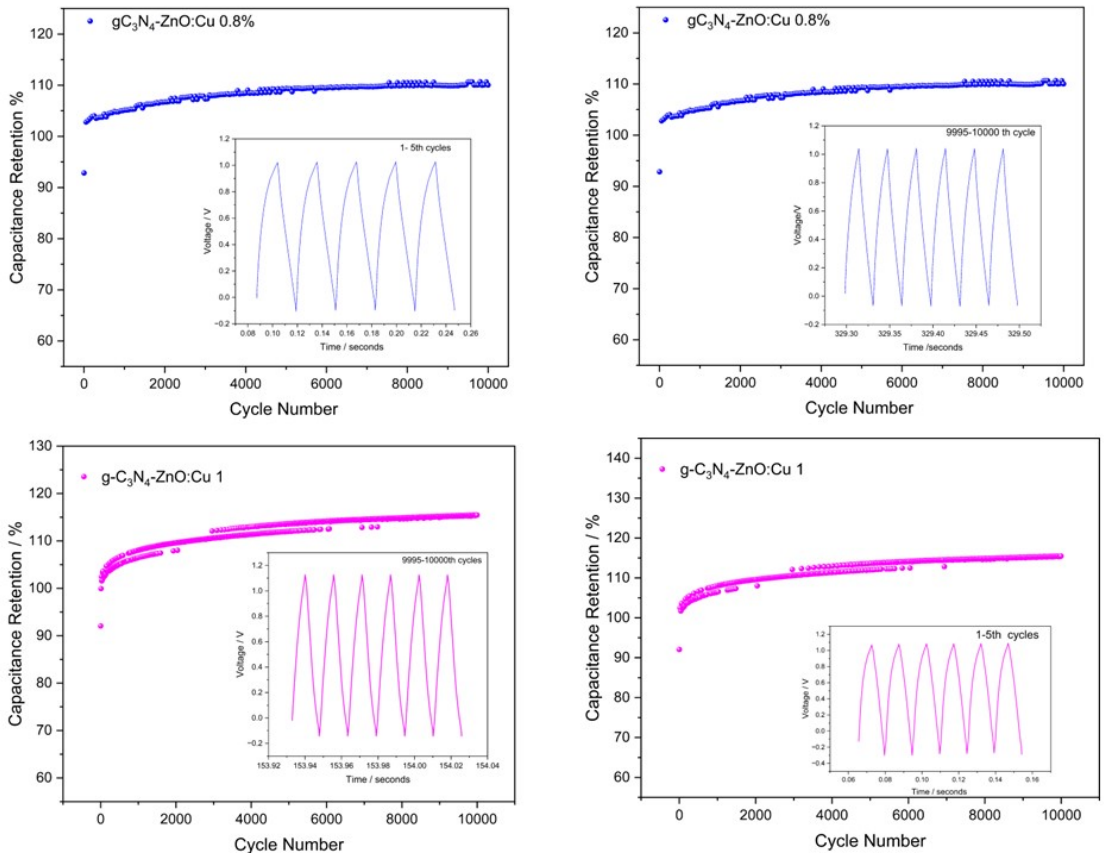

Figure S-Ret: Capacitance retention graphs for g-C3N4-ZnO:Cu 0.8% and g-C3N4-ZnO:Cu 1 % device. Charge discharge curves at first and last five cycles (Inset).