Electronic Supplementary Information (ESI)

Covalently Benzimidazole Linked Reduced Graphene Oxide/Polyaniline Nanocomposite as Electrode Material

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a) NMR and FTIR spectra:

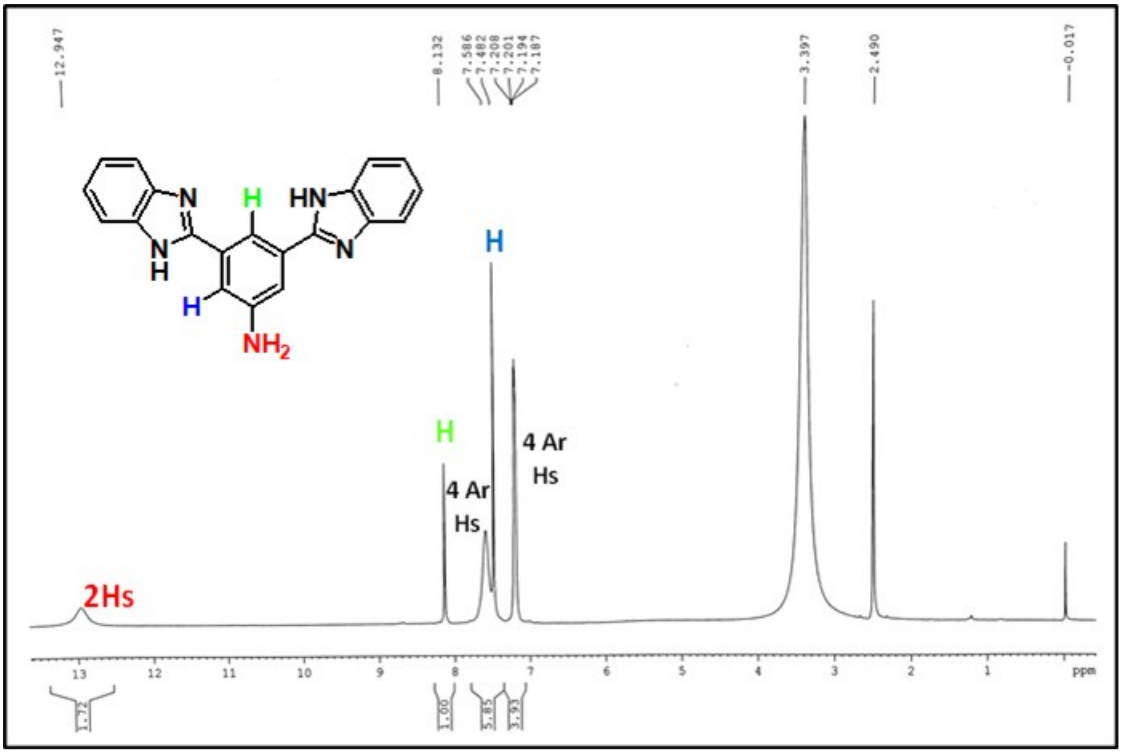

Fig. S1: ^{1}H-NMR of 1, 3-bis(2'-benzimidazolyl)-5-aminobenzene

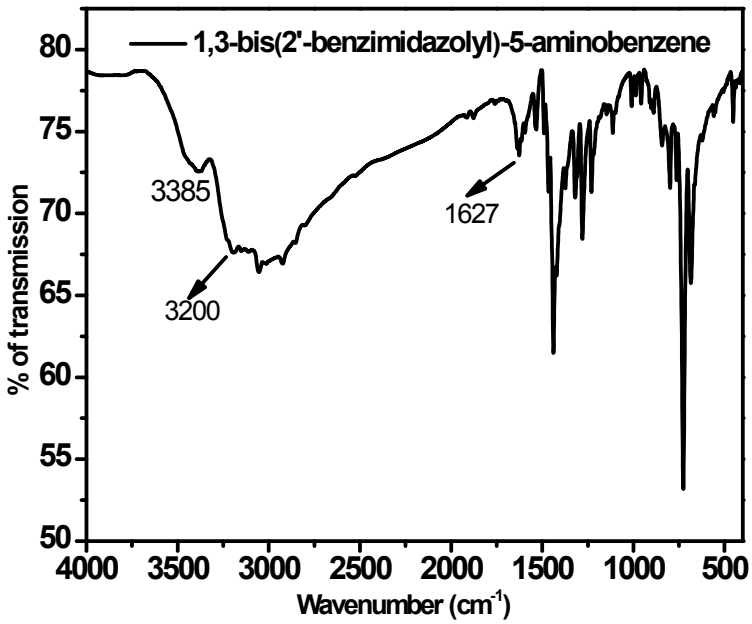

Fig. S2: FT-IR Spectra of 1, 3-bis(2'-benzimidazolyl)-5-aminobenzene

b) XRD study:

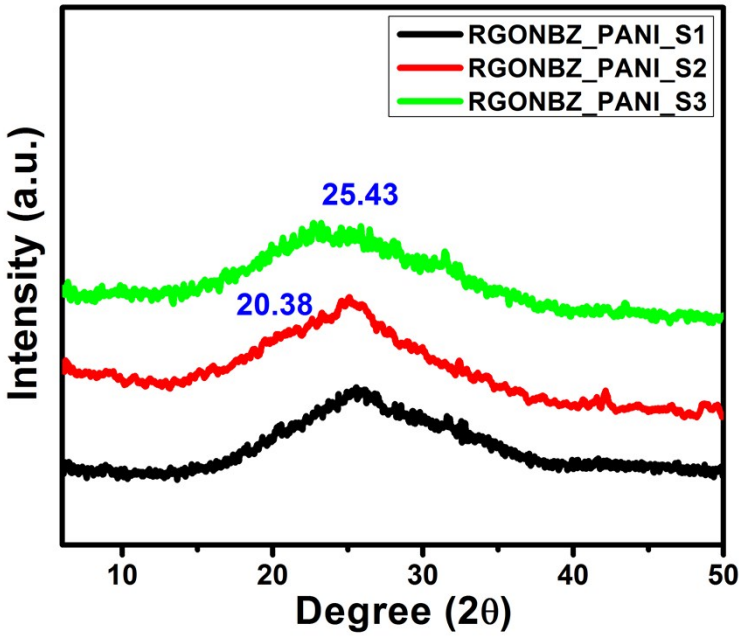

Fig. S3: XRD plot of the RGONBZ_PANI nanocomposites

c) XPS of GO:

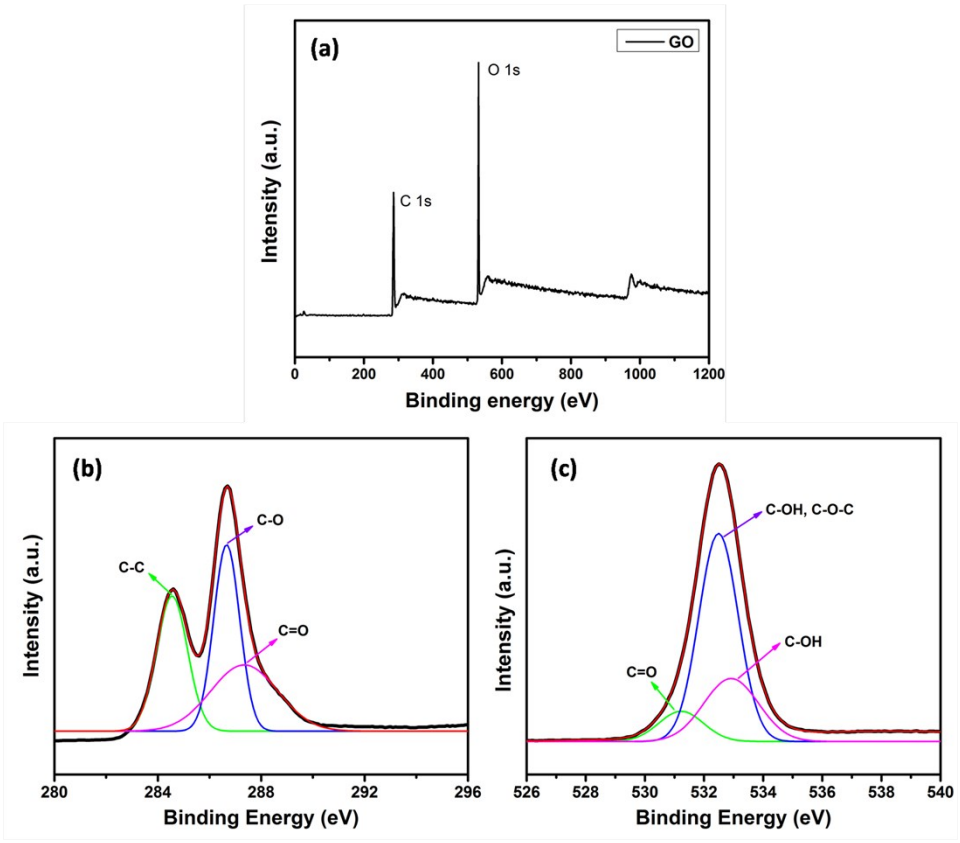

Fig. S4: (a) XPS survey spectra of GO; (b) deconvoluted C 1s spectra of GO and (c) deconvoluted O 1s spectra of GO

d) FESEM Image of GO:

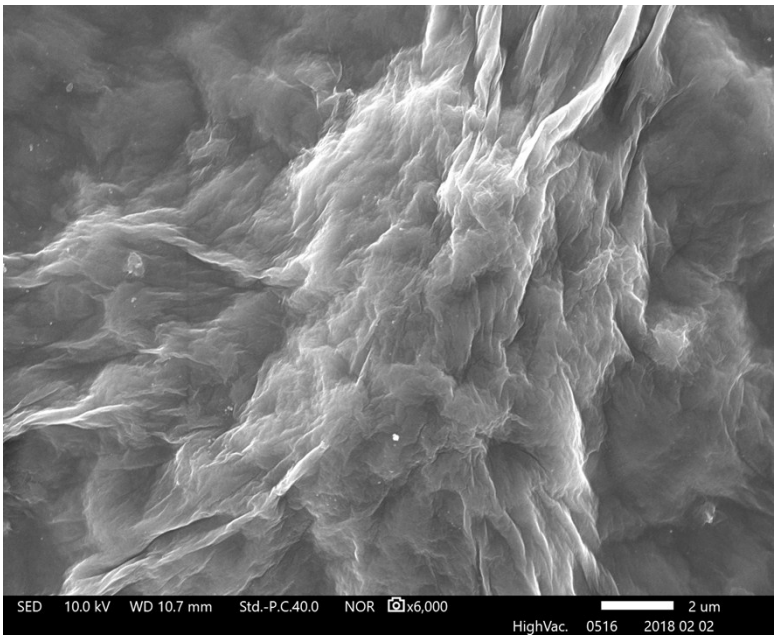

Fig. S5: FESEM Image of GO

e) CV studies:

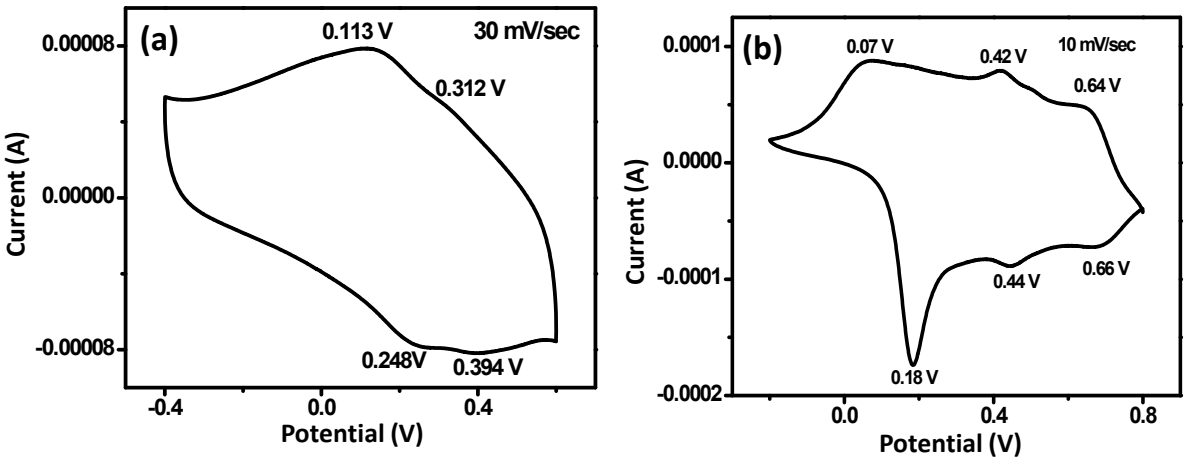

Fig. S6: CV study of **(a)** RGONBZ at 30 mV/s and **(b)** RGONBZ_PANI_S2 at 10mV/s

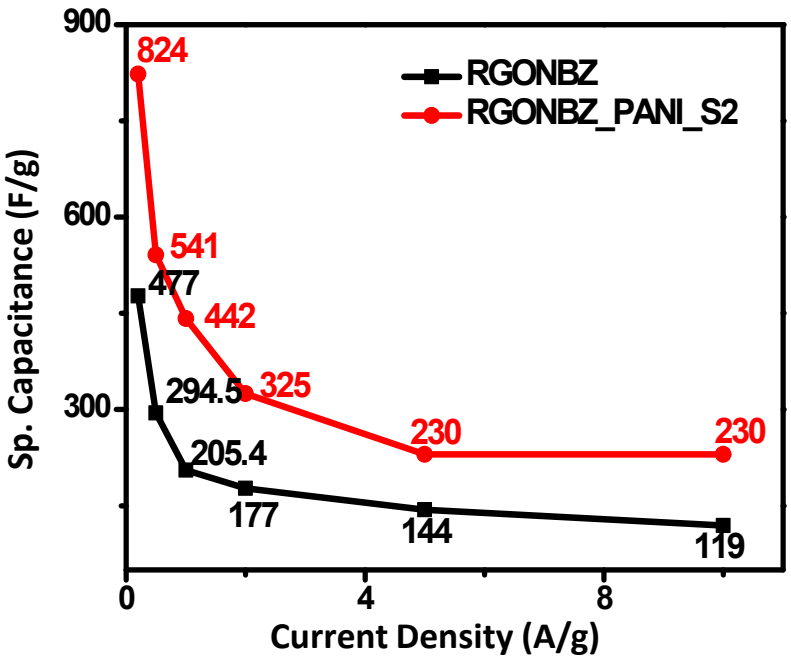

Fig. S7: Specific Capacitance vs. Current density plot for RGONBZ and RGONBZ_PANI_S2

f) GCD Studies:

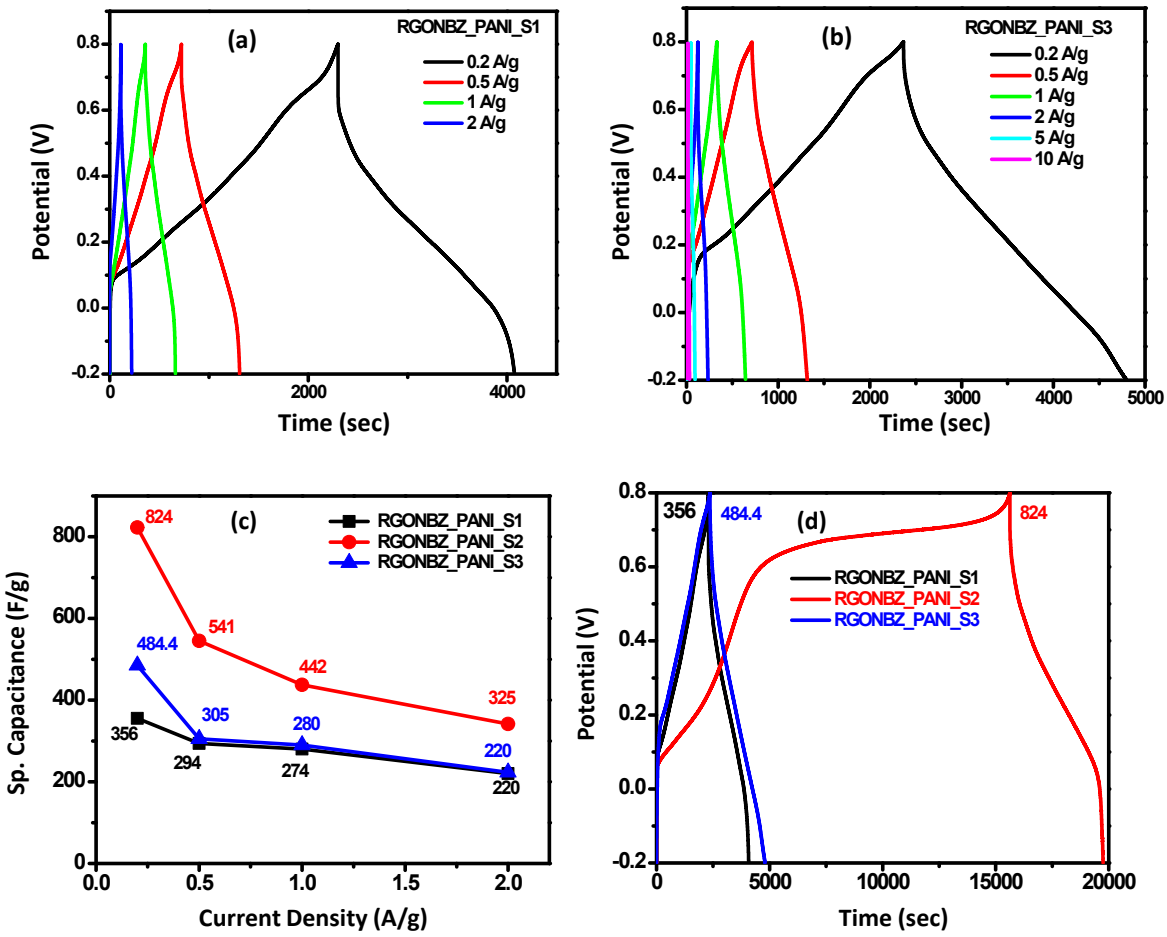

Fig. S8: Charge-Discharge cycle at different current densities of (a) RGONBZ_PANI_S1, (b) RGONBZ_PANI_S3, (c) Specific capacitance vs. charge density plots for the three binary composite materials and (d) Charge –discharge comparison of three different binary composites at 0.2 A/g current densities.

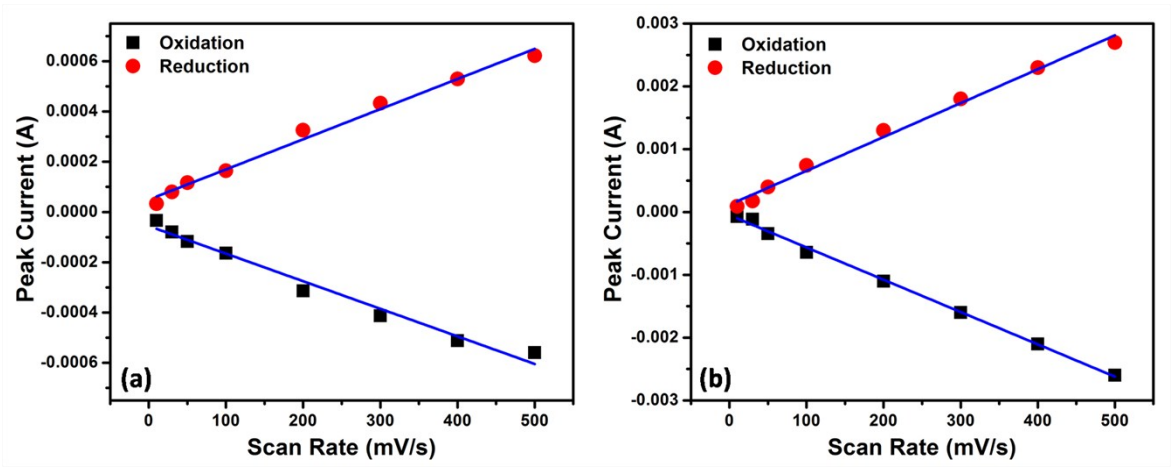

Fig. S9: Plot of peak current vs. scan rate

g) Impedance studies:

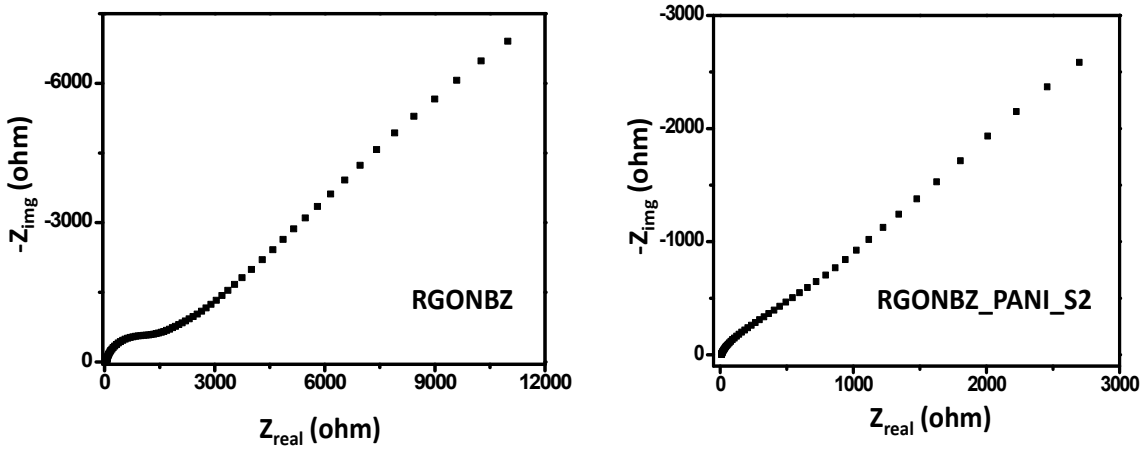

Fig. S10: Impedance Spectra of (a) RGONBZ & (b) RGONBZ_PANI_S2

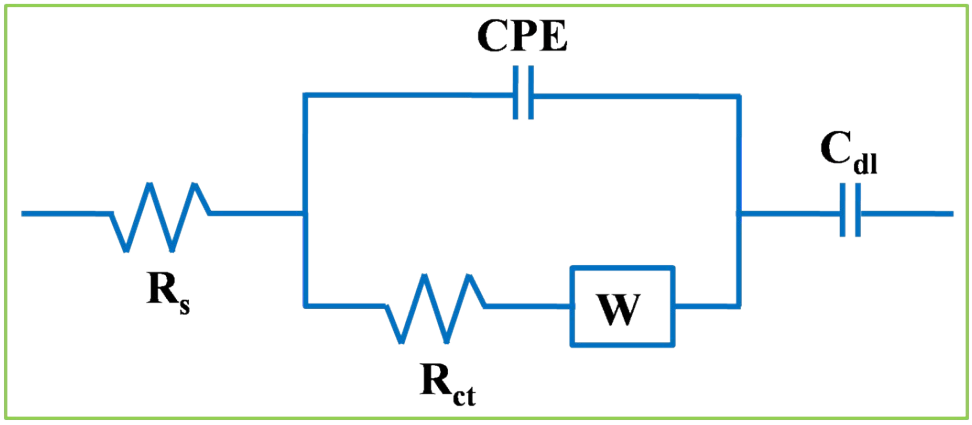

Fig. S11: The equivalent circuit used for the fitting of Nyquist plots (C_{dl} = double layer capacitance, W = Warburg impedance, R_{ct} = Charge-transfer resistance, R_s = Solution resistance, CPE = constant phase element)

h) Comparative data of specific capacitance & capacitance retention for the related rGO & PANI Materials

Table S1: Comparative data of specific capacitance & capacitance retention for the related rGO & PANI Materials

Materials	Specific Capacitance (F g^{-1})	Capacitance Retention	Reference
BI-G	781 at 0.1 A g^{-1}	85%	1
NG	301 at 0.1 A g^{-1}	97.1%	2
GNS/PANI	532.3 at 2mV/Sec	99.6%	3
GO/PANI	425 at 0.2 A g^{-1}	83%	4
CFGO-PANI	525 at 0.3 A g^{-1}	91%	5
RGONBZ	**477 at 0.2 A g^{-1}**	**87.9%**	**Present Work**
RGONBZ_PANI_S2	**823 at 0.2 A g^{-1}**	**77.5%**	**Present Work**