Supporting Information

A metal-free reduced graphene oxide coupled covalent imine network as anode material for lithium ion batteries

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Materials and Instruments

Phloroglucinol, mesitylene, benzene-1, 4-dicarboxaldehyde, cyanuric chloride and hydrazine hydrate were purchased from Sigma-aldrich. Dioxane and Acetic acid were obtained from Merck, India. All the chemicals were used without any further purification. Distilled water was used throughout the experiments.

Powder x-ray diffraction patterns were recorded on Bruker AXS D8 Advanced SWAX diffractometer using Ni-filtered Cu Kα (λ= 0.15406 nm) radiation. Fourier transform infrared spectra (FTIR) were measured with a Perkin-Elmer Spectrum 100 spectrophotometer. Solid state magic angle spinning NMR spectra were recorded in a 500 MHz Bruker Advanced II spectrometer at a sample spinning rate of 8 kHz. Nitrogen adsorption and desorption isotherms were measured at 77 K using a Quantachrome Instruments iSorb HP1, surface area analyser. All the samples were degassed at 150 ^{o}C for 10 h before the measurement. Thermogravimetric analysis was performed in TGA instrument thermal analyser TA-SDT Q-600, over the temperature range 30 to 800 ^{o}C with heating rate of 10 ^{o}C min^{-1} under N_2 flow. Scanning electron microscopy (SEM) images were collected in JEOL JEM 6700F with an electron diffraction spectroscopy (EDS) detector. On a JEOL JEM 2010 transmission electron microscope, HRTEM images of the samples were collected. On an Omicron Nanotechnology XPS 0571 spectrometer, X-ray photoelectron spectroscopy (XPS) was performed. Perkin-Elmer 2400 series-II CHN analyser was used for elemental analysis. Trivista 555 spectrograph (Princeton Instruments) was used to record resonance Raman data with 532 nm excitation from a Kr^{+} laser (Coherent, Sabre Innova SBRC-DBWK).

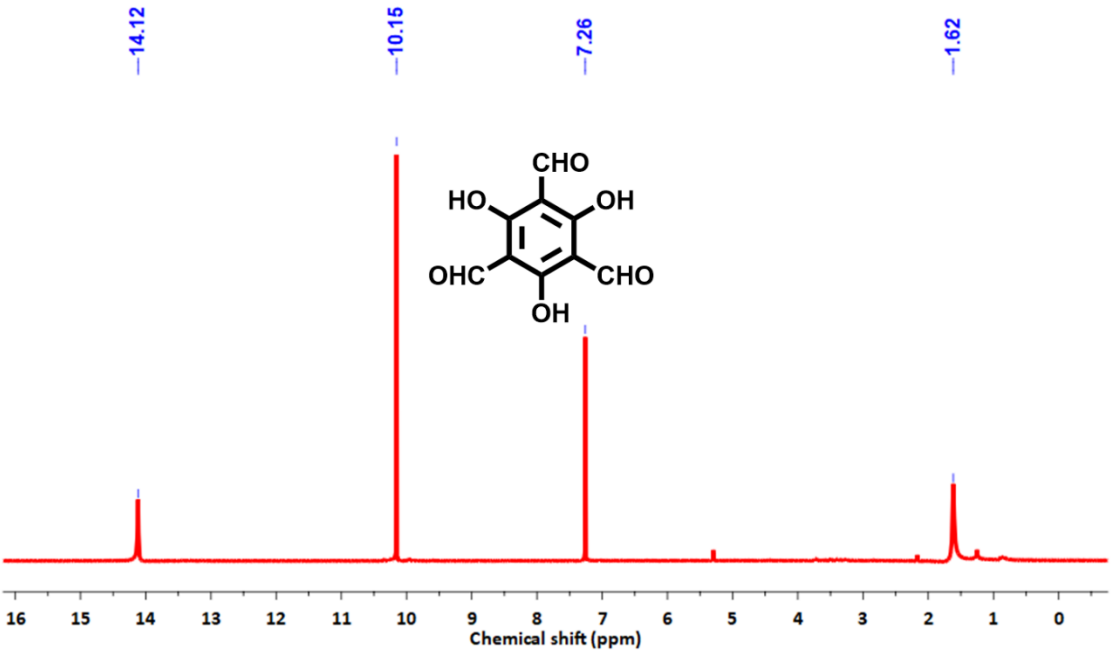

Figure S1. ^{1}H NMR of 1,3,5-triformylphloroglucinol in $CDCl_3$.

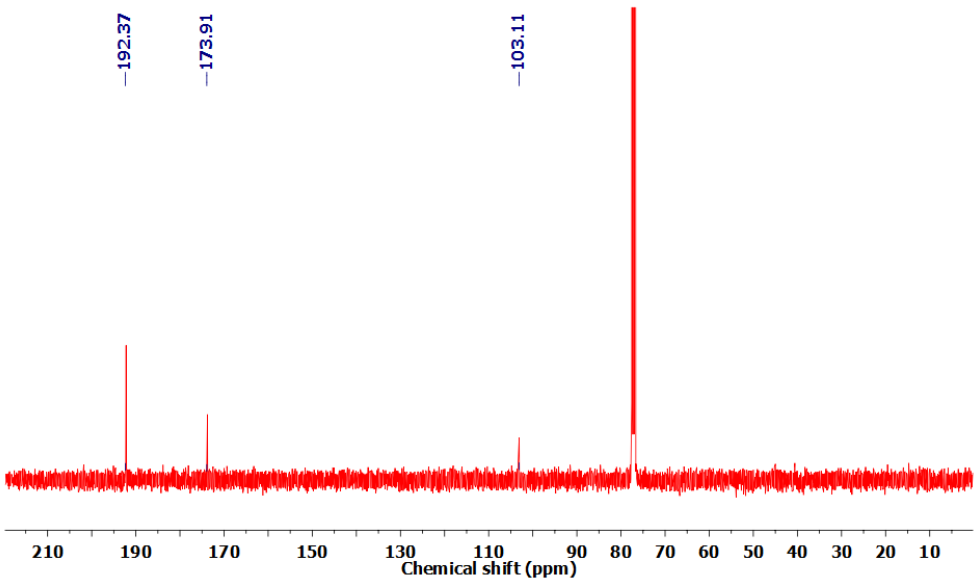

Figure S2. ^{13}C spectra of 1,3,5-triformylphloroglucinol in $CDCl_3$.

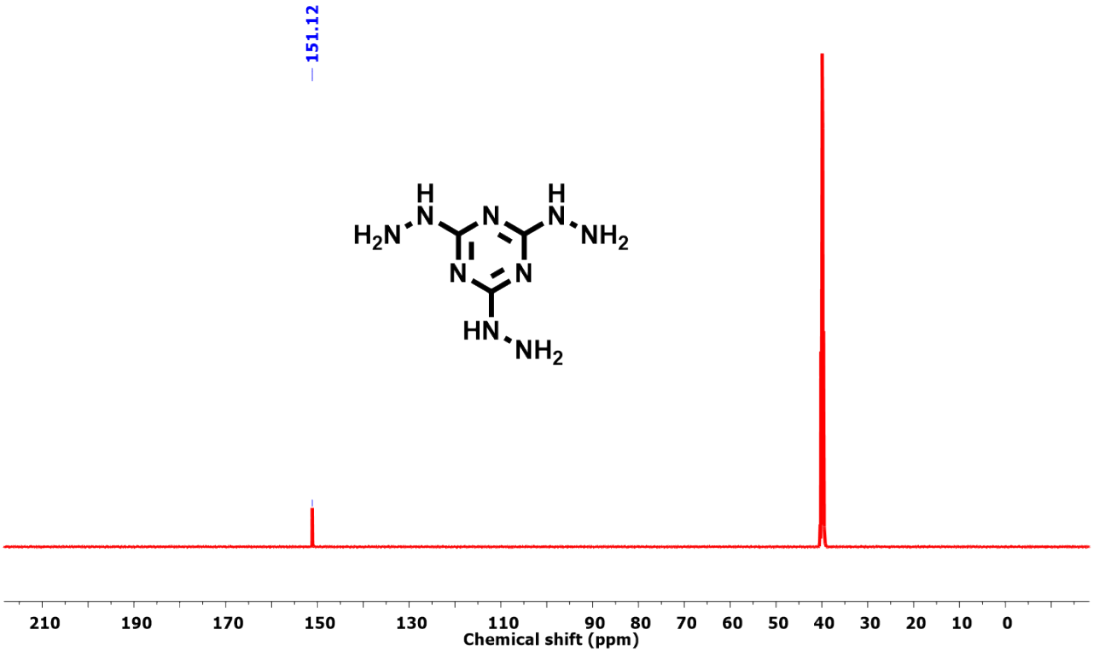

Figure S3. ^{13}C spectra of 2,4,6-trihydrazinyl-1,3,5-triazine in DMSO-d6.

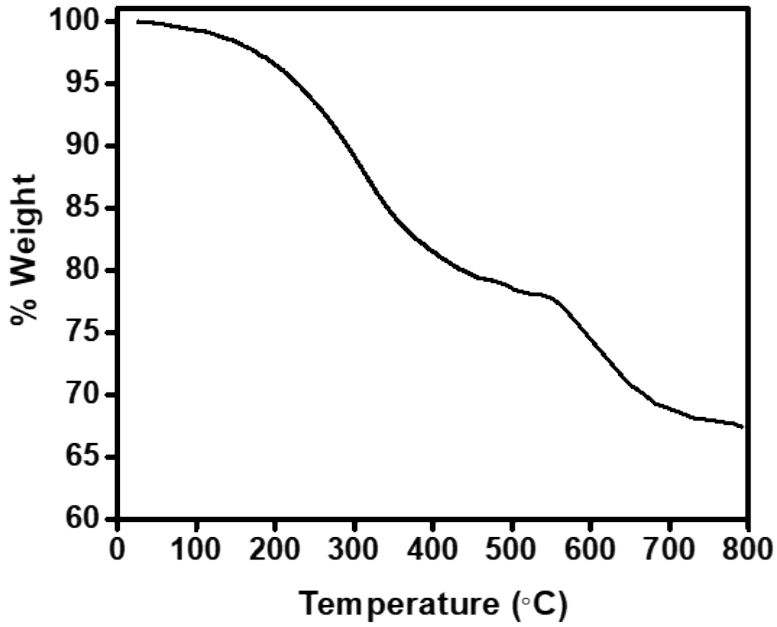

Figure S4. Thermogravimetric analysis plot of TP-THzT-CIN.

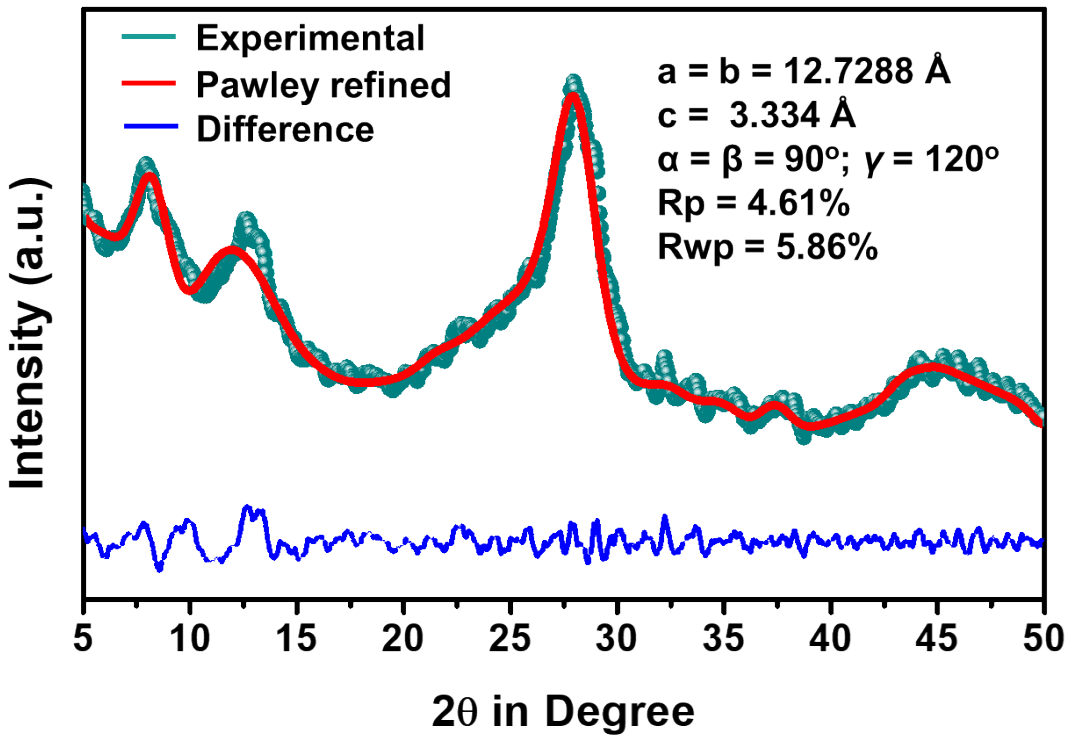

Figure S5. Pawley refined (red) powder X-ray profile with experimental (cyan) data of Tp-THzT-CIN.

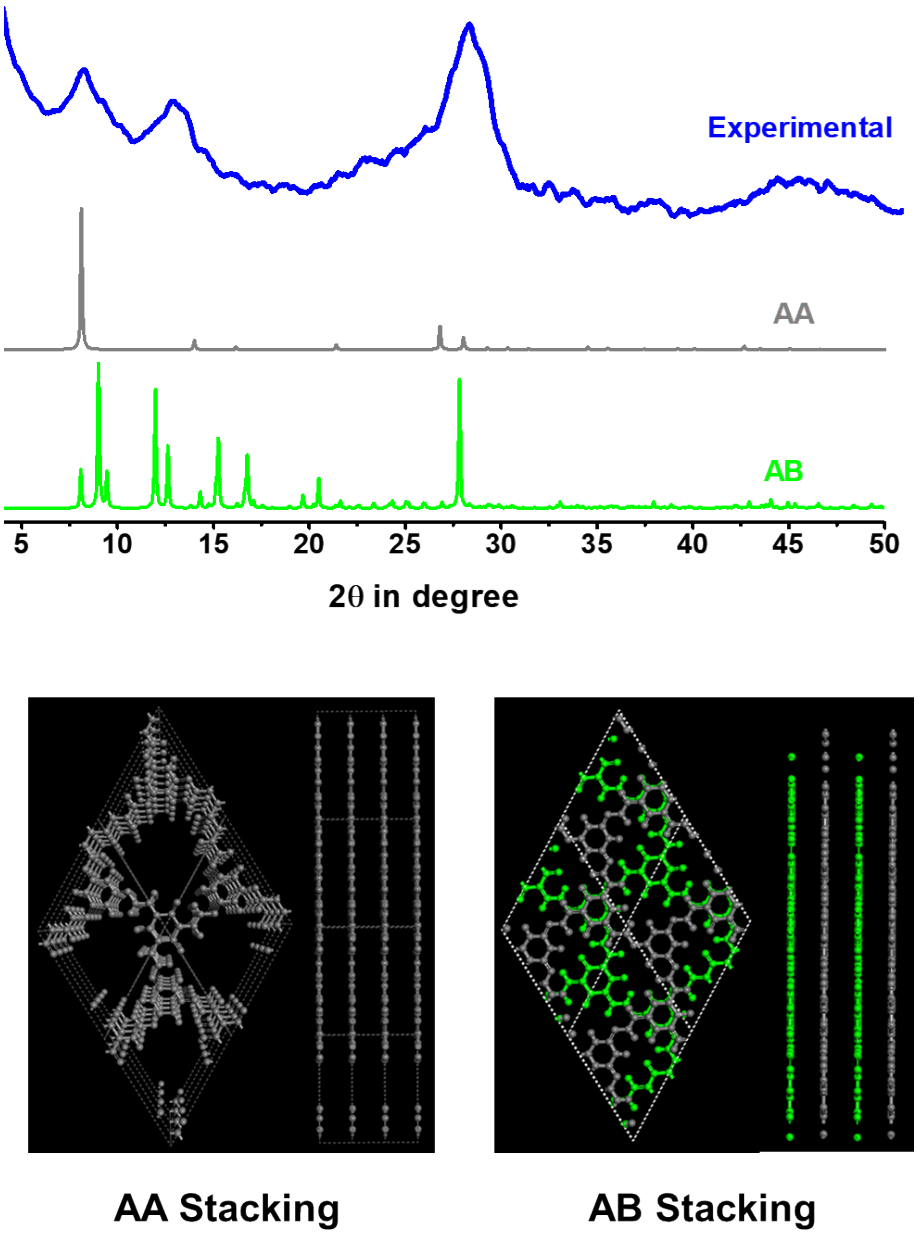

Figure S6. Experimental PXRD pattern of the Tp-THzT-CIN with simulated PXRD patterns for AA stacking and AB stacking model.

Table S1. Unit cell parameters and fractional atomistic coordinates of TP-THzT-CIN.

AA Stacking **Hexagonal $P\bar{6}$ Space group** **$a = b = 12.7288$ Å; $c = 3.334$ Å** **$\alpha = \beta = 90^o$; $\gamma = 120^o$**							
Atom	**x**	**y**	**z**	**Atom**	**x**	**y**	**z**
C23	**-0.11379**	**0.00555**	**0**	**N29**	**0.55920**	**0.22177**	**0**
C24	**-0.12132**	**-0.11559**	**0**	**O30**	**0.01248**	**0.22506**	**0**
C25	**0.23137**	**0.22525**	**0**	**H31**	**1.33340**	**1.14007**	**0**
N	**0.33963**	**0.22732**	**0**	**H32**	**0.86371**	**1.34394**	**0**
N27	**0.44971**	**0.33513**	**0**	**H33**	**2.08106**	**1.76663**	**0**
C28	**0.55125**	**0.32904**	**0**				

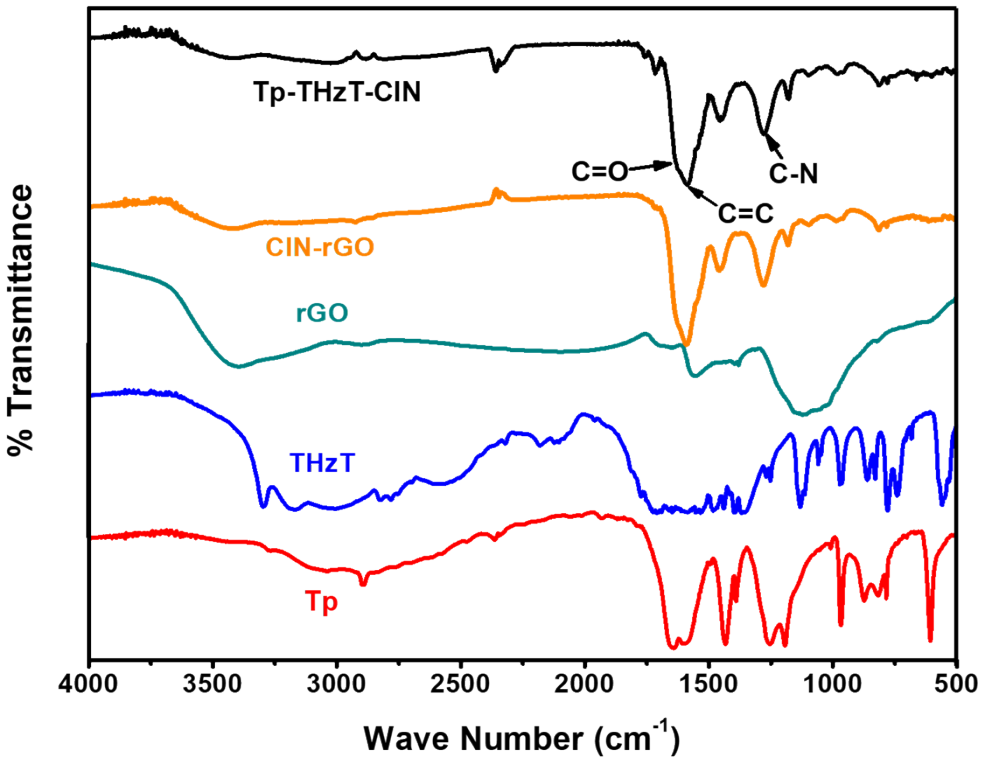

Figure S7. FT-IR spectra of Tp, THzT, rGO, TP-THzT-CIN and CIN-rGO.

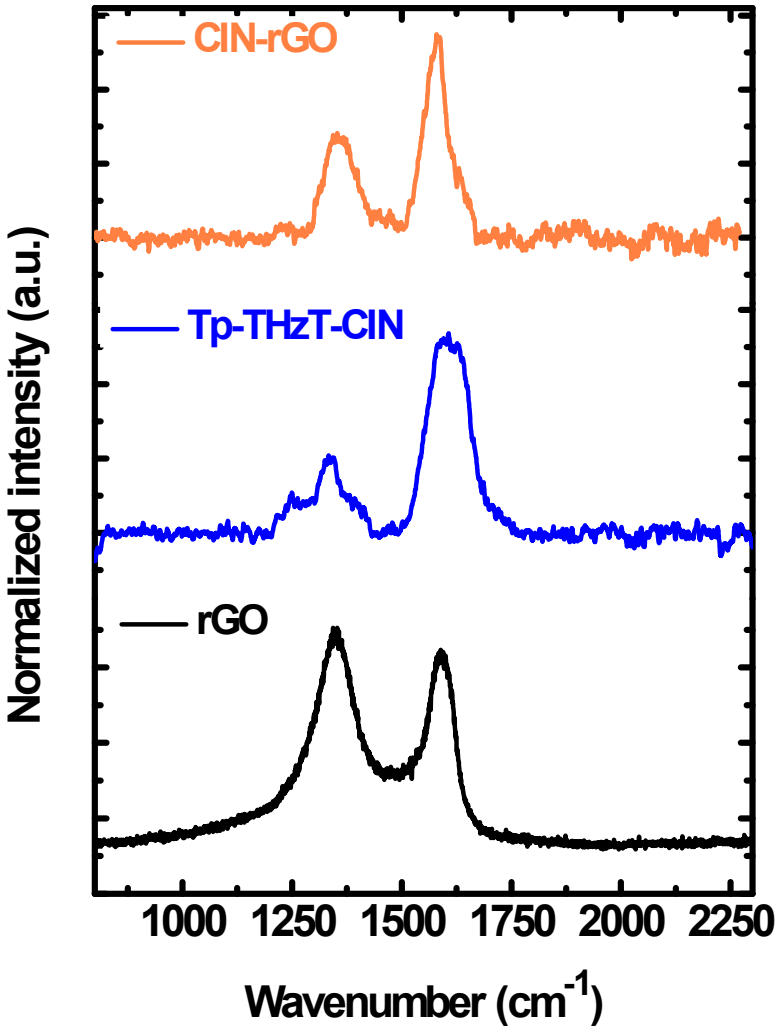

Figure S8. The Raman spectra of rGO and Pristine CIN and CIN-rGO composite.

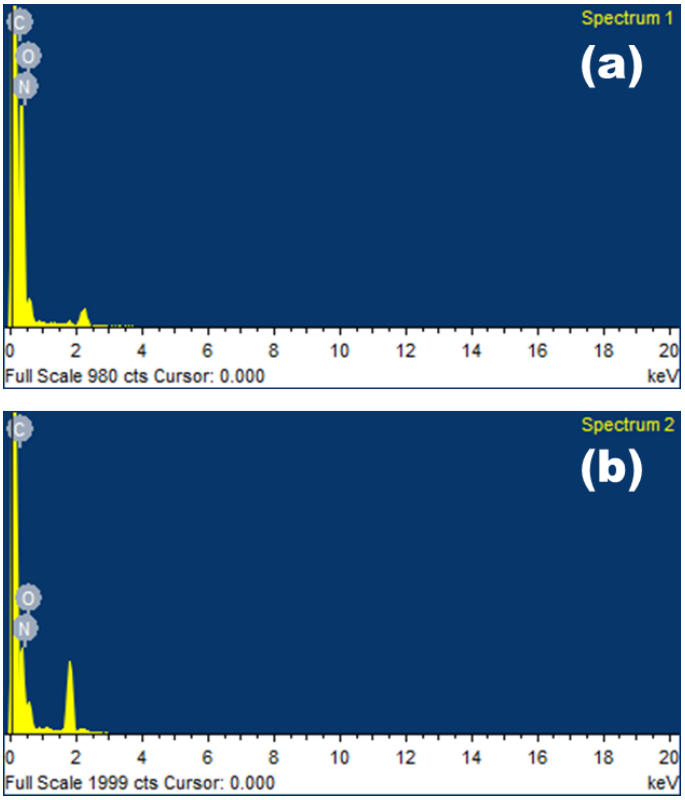

Figure S9. Energy dispersive X-ray spectrum of the Tp-THzT-CIN and CN-rGO composite.

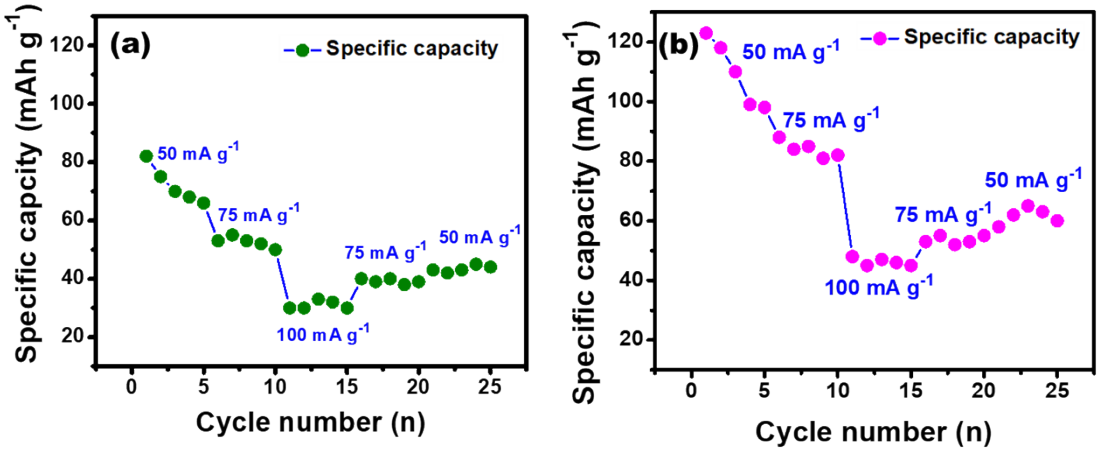

Figure S10. Specific capacities of Tp-THzT-CIN (a) and CIN-rGO composite (b) at different current densities.