

## SUPPORTING INFORMATION

### Molecular Engineered A-D-A-D-A Organic Electrode System for Efficient Supercapacitor Applications

Sudhir D. Jagdale,<sup>a,c</sup> Chepuri R.K. Rao,<sup>a,c,\*</sup> Sidhanath V. Bhosale,<sup>a,c,\*</sup> Sheshanath V. Bhosale,<sup>b,\*</sup>

<sup>a</sup>Polymers and Functional Materials Division, CSIR-Indian Institute of Chemical Technology, Hyderabad-500007, Telangana, India.

<sup>b</sup>Department of Chemistry, School of Chemical Sciences, Central University of Karnataka, Kadaganchi, Kalaburagi-585 367, Karnataka, India

<sup>c</sup>Academy of Scientific and Innovative Research (AcSIR), Ghaziabad- 201002, Uttar Pradesh, India

**\*Corresponding Authors:** [ramchepuri@iict.res.in](mailto:ramchepuri@iict.res.in); [bhosale@iict.res.in](mailto:bhosale@iict.res.in);  
[bsheshanath@gmail.com](mailto:bsheshanath@gmail.com)

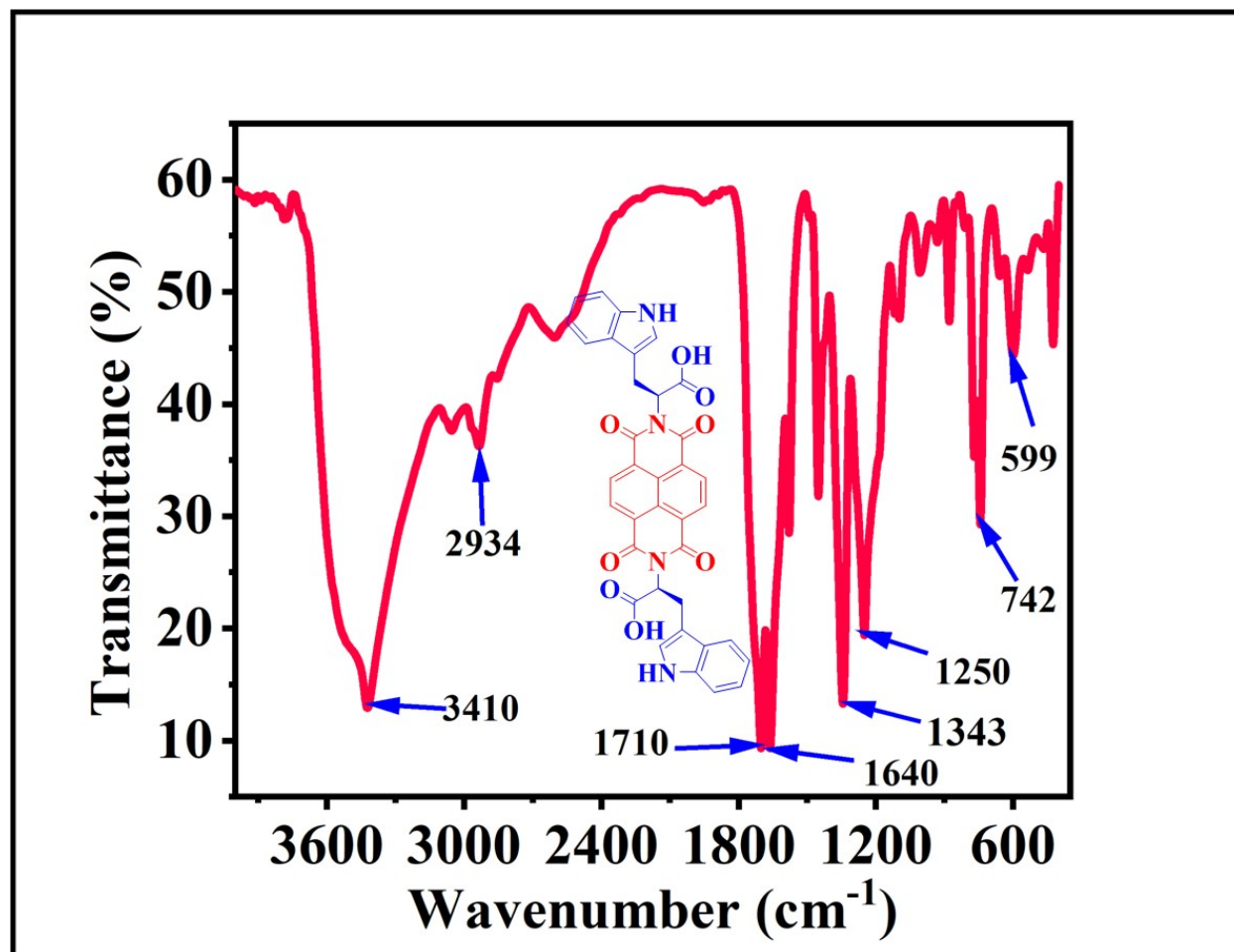


Fig.S1. FT-IR spectra of NDI-Trp.

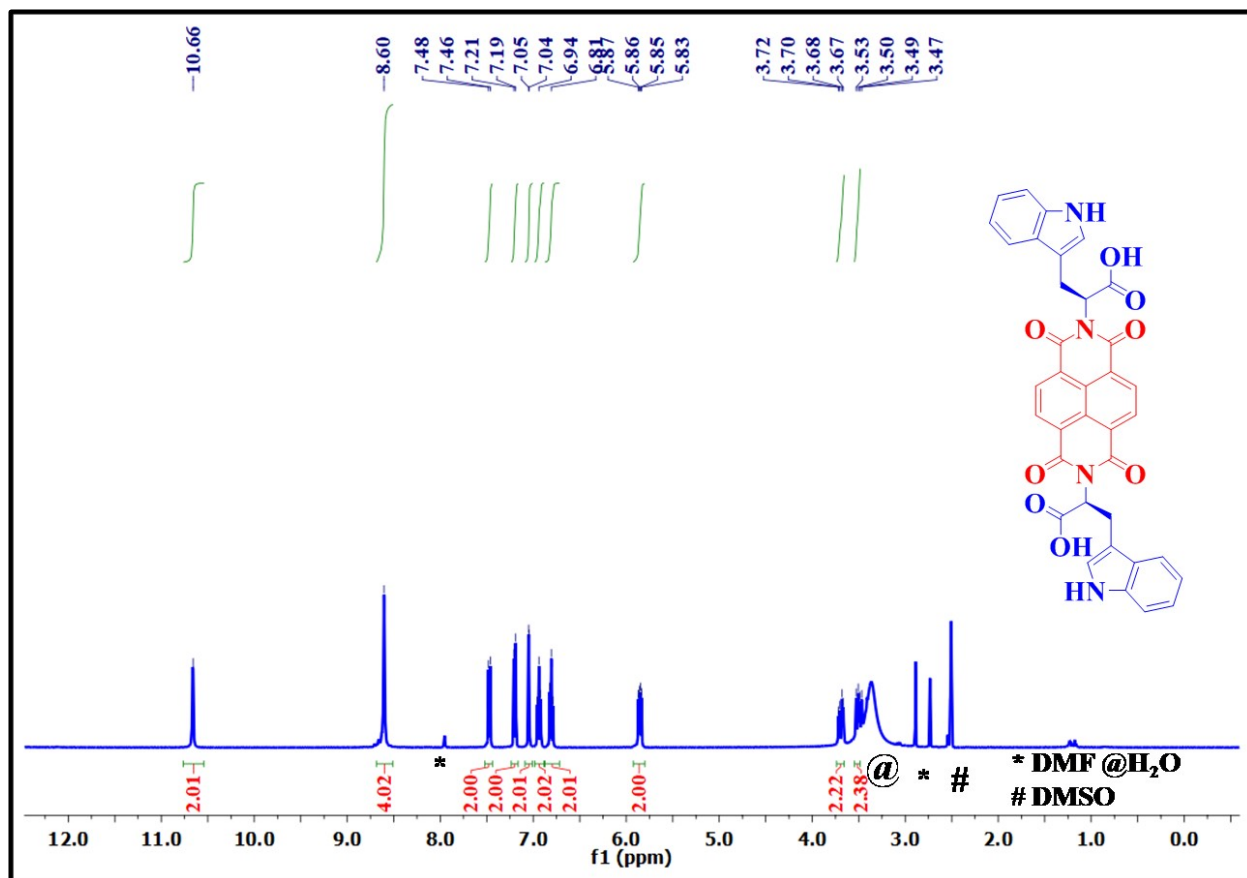


Fig.S2.  $^1\text{H}$  NMR spectra of NDI-Trp.

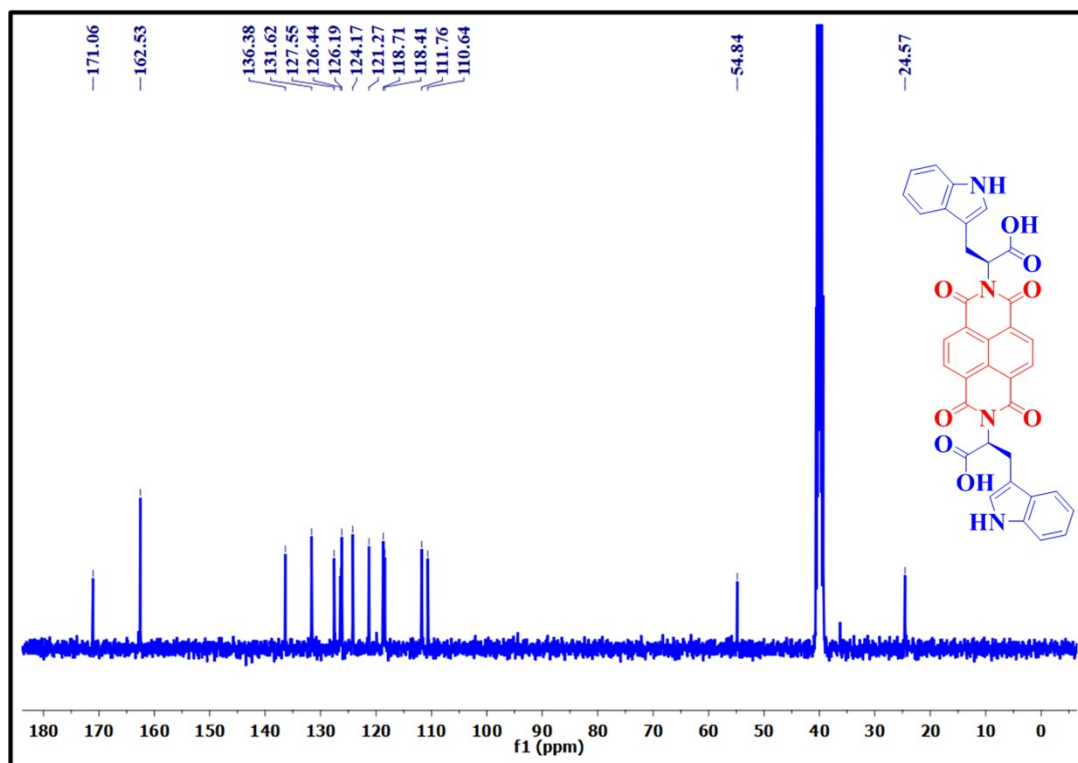


Fig.S3.  $^{13}\text{C}$  NMR spectra of NDI-Trp.

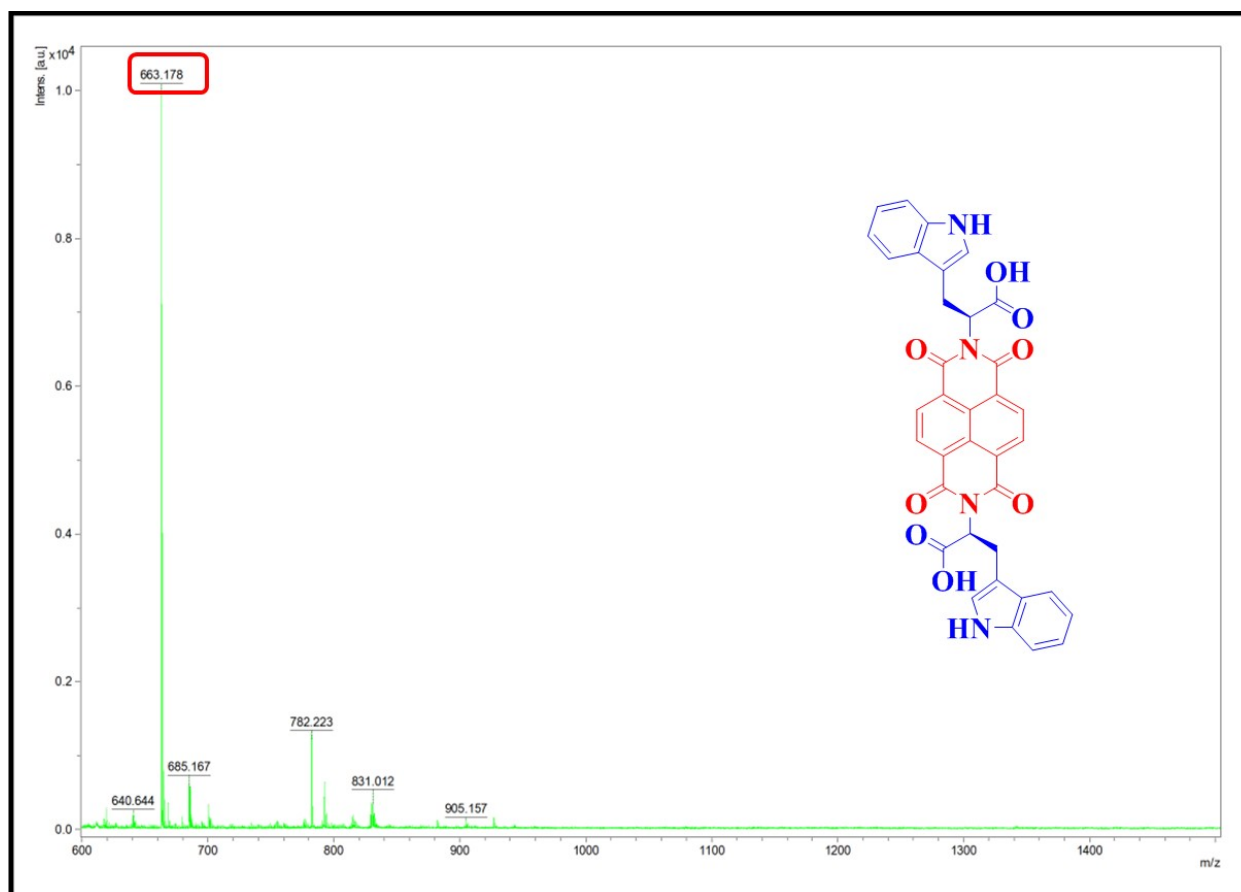


Fig. S4. MALDI-TOF spectrum of NDI-Trp.

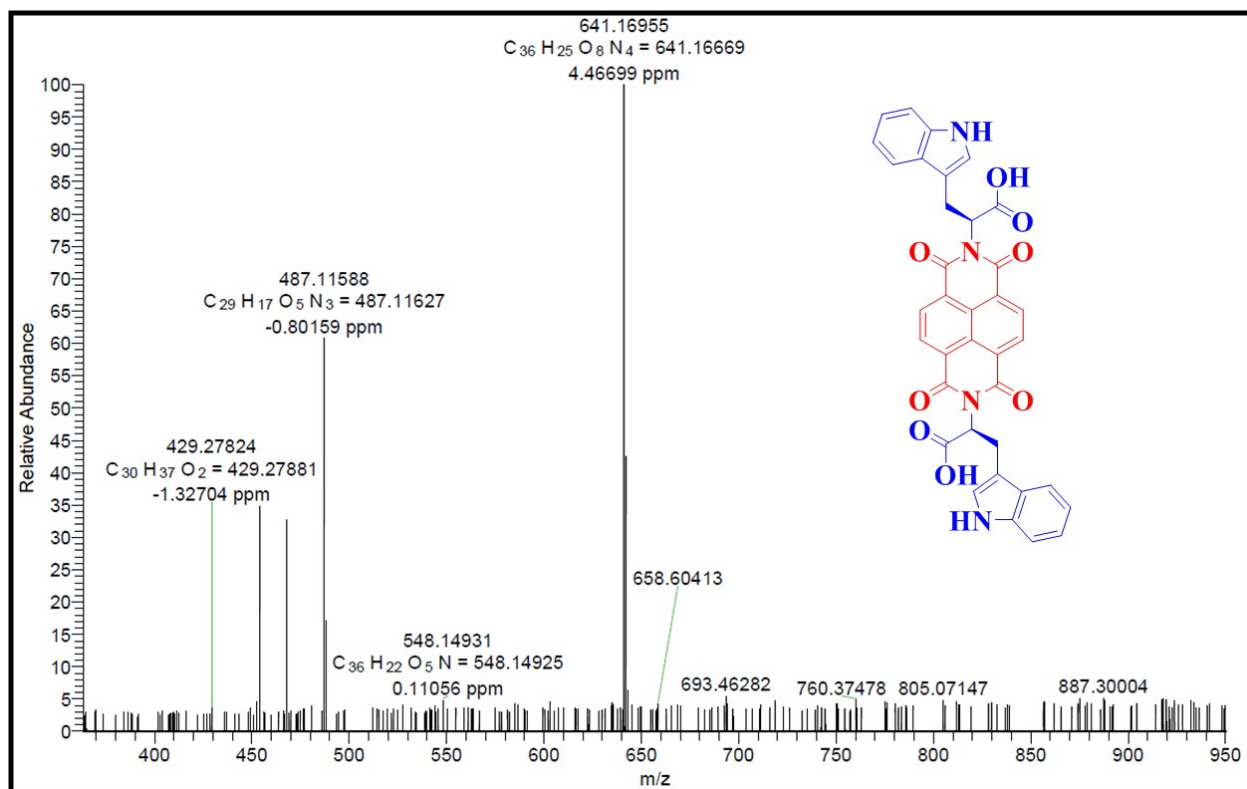


Fig. S5. HRMS spectrum of NDI-Trp.

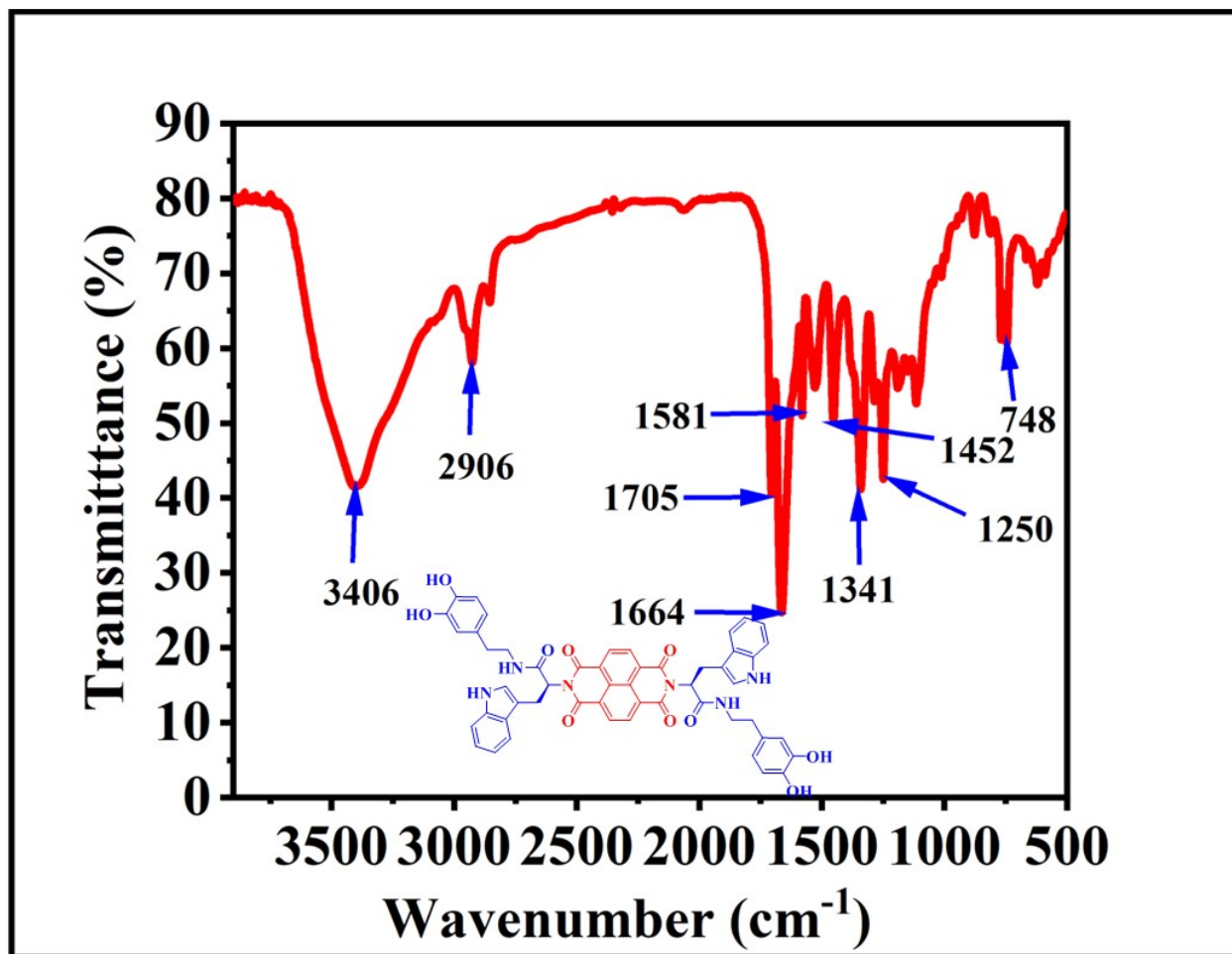


Fig. S6. FT-IR spectra of NDI-Trp-DP.

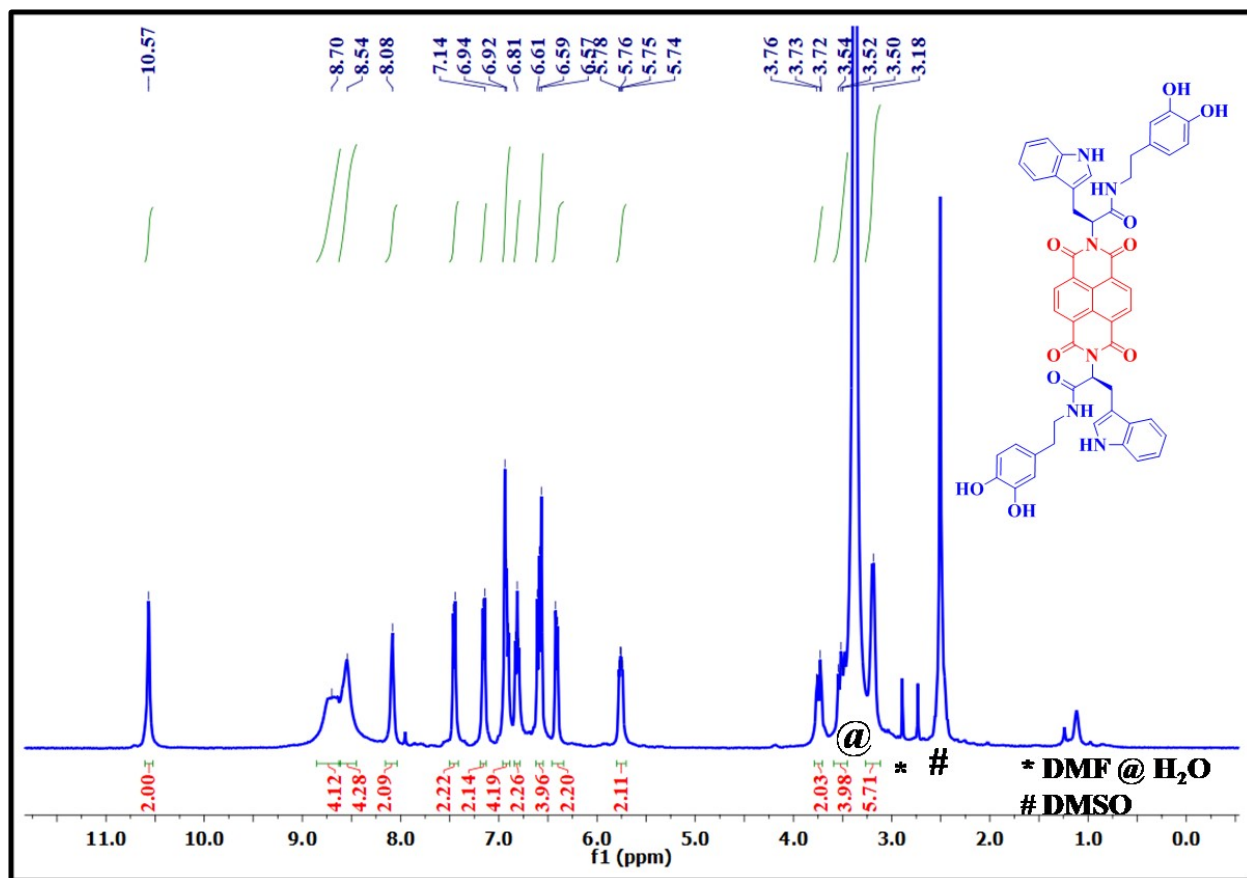


Fig. S7. <sup>1</sup>H NMR spectra of NDI-Trp-DP.



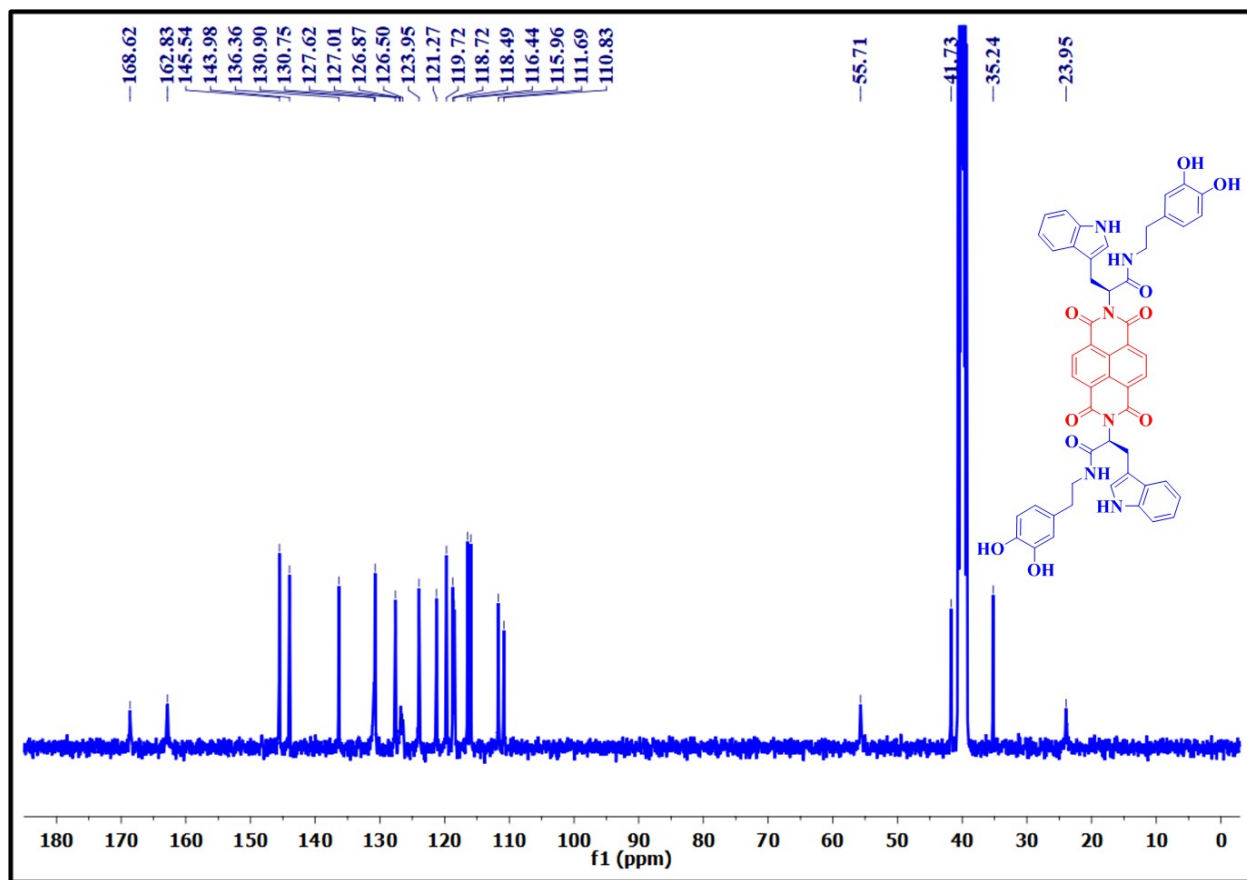
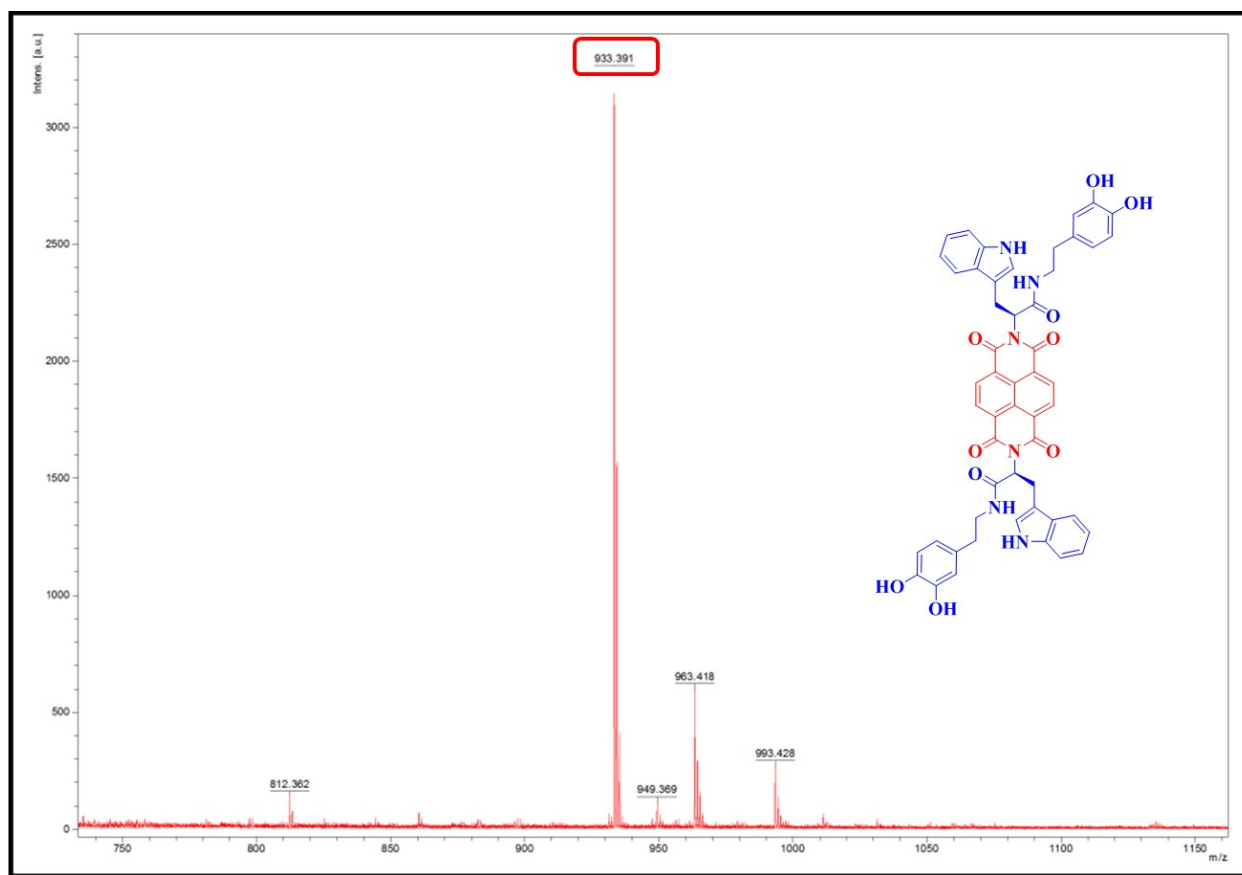


Fig.S8. <sup>13</sup>C NMR spectra of NDI-Trp-DP.



**Fig. S9.** MALDI-TOF spectrum of NDI-Trp-DP.

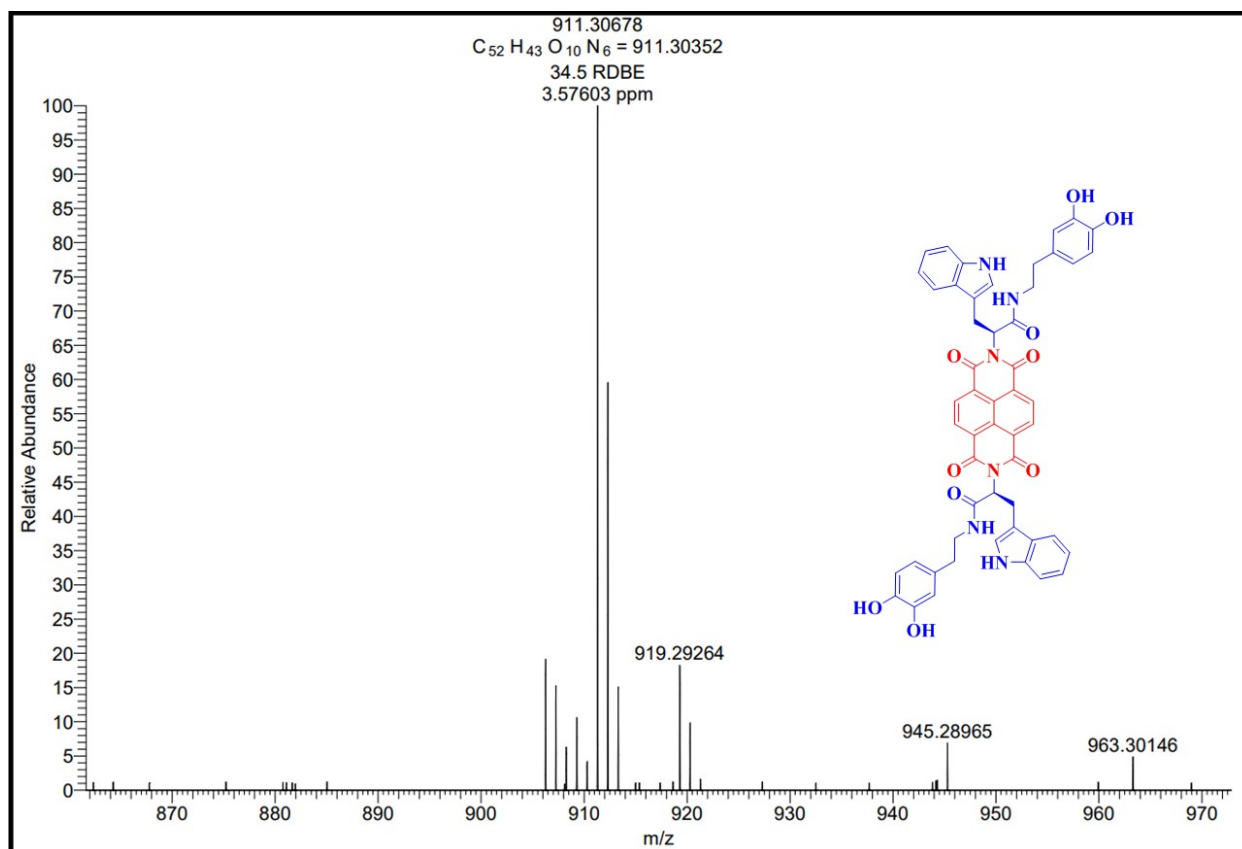
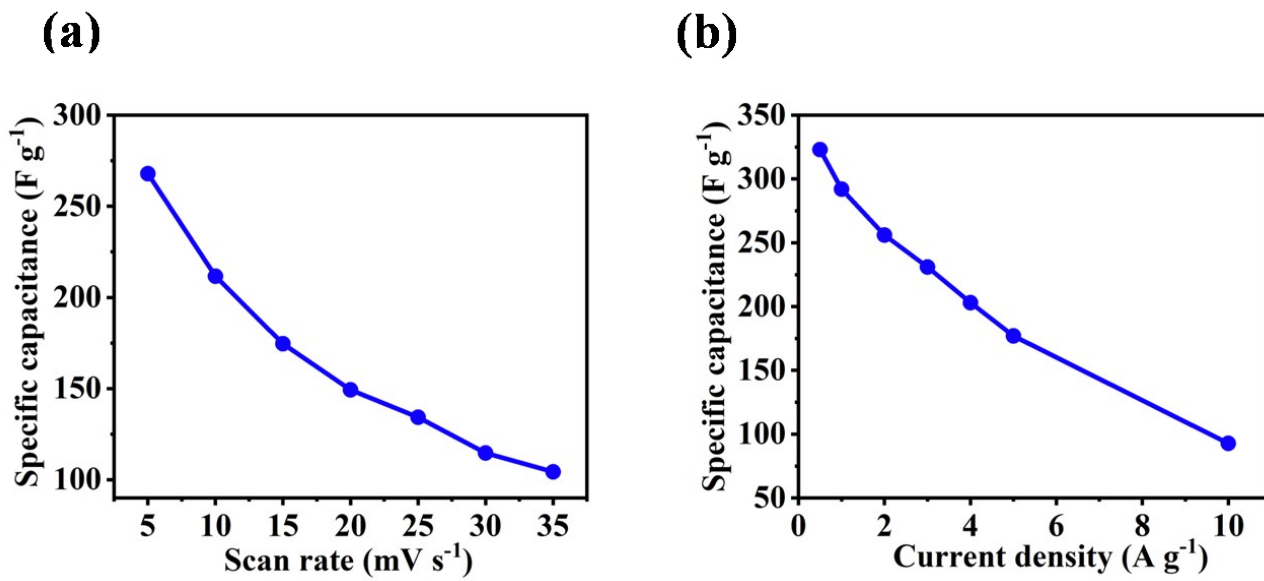
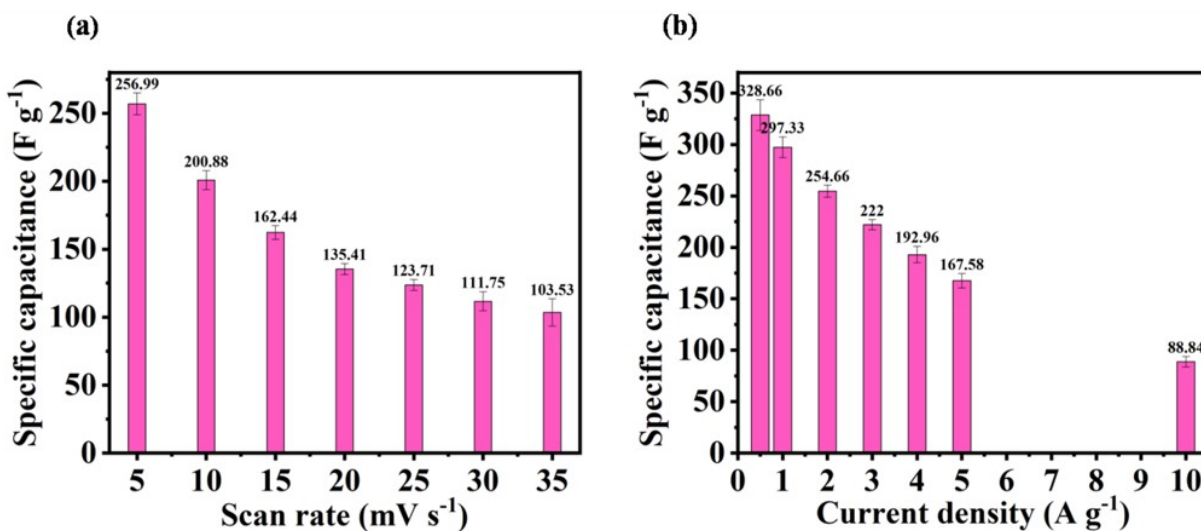


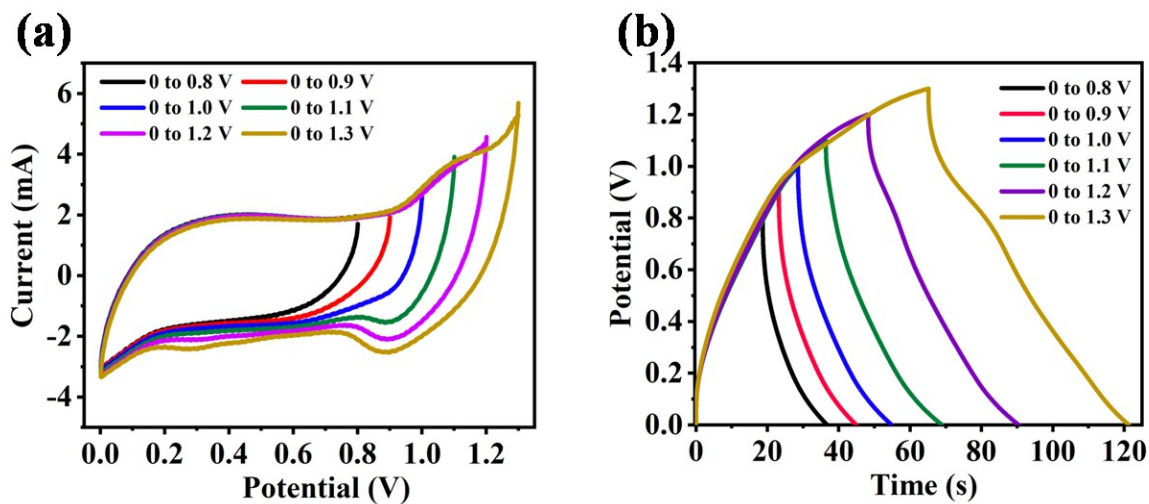
Fig. S10. HRMS spectrum of NDI-Trp-DP.



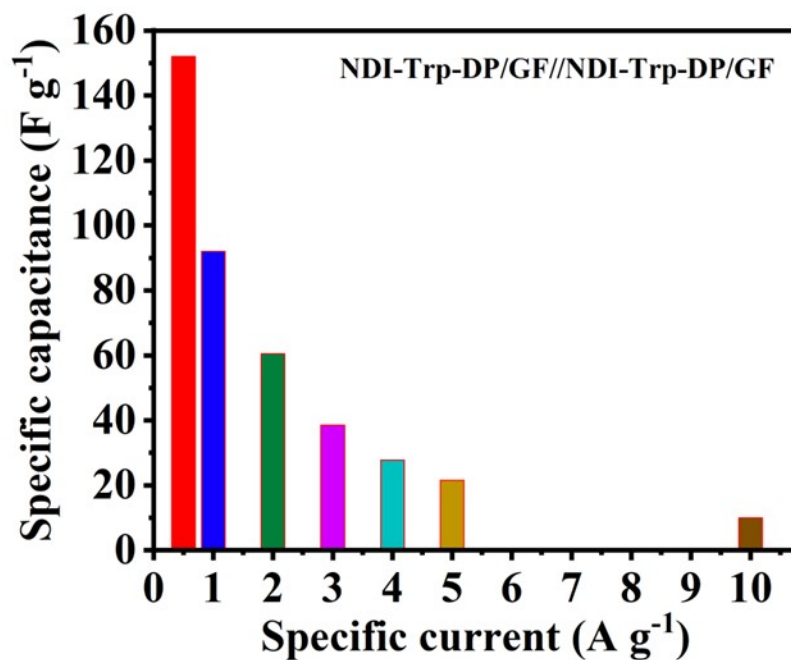
**Fig. S11.** (a) Specific capacitance variation for different scan rate and (b) Variation of specific capacitance versus various current densities for three-electrode system NDI-Trp-DP/GF.



**Fig. S12.** Error bar graph (a) specific capacitance variation for different scan rate and (b) variation of specific capacitance versus various current densities for three-electrode system NDI-Trp-DP/GF.



**Fig. S13.** (a) CVs of the NDI-Trp-DP/GF//NDI-Trp-DP/GF device measured at various potential at a scan rate of  $10 \text{ mV s}^{-1}$ ; (b) GCD curves at fixed current density  $1 \text{ A g}^{-1}$  for the NDI-Trp-DP/GF//NDI-Trp-DP/GF device measured at different potential windows.



**Fig. S14.** Specific capacitance at specific current density 0.5, 1, 2, 3, 4, 5, and  $10 \text{ A g}^{-1}$  for symmetric cell device NDI-Trp-DP/GF//NDI-Trp-DP/GF.