

## Layer-by-layer assembling redox wood electrodes for efficient energy storage

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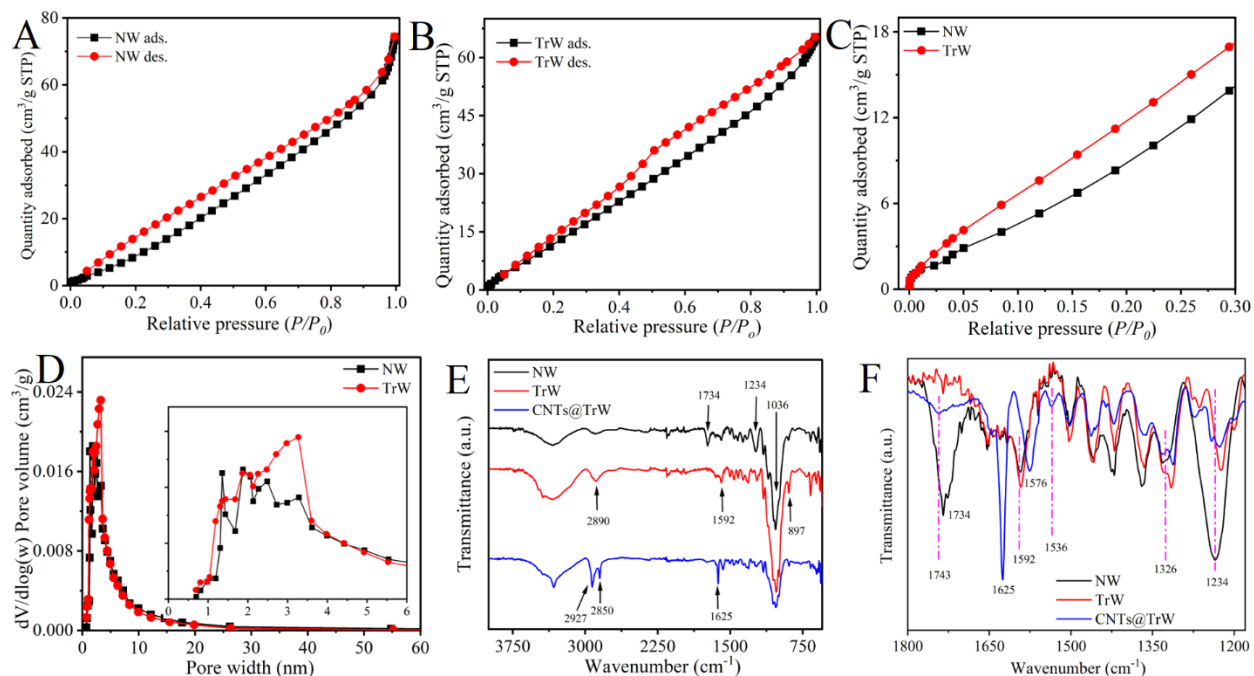
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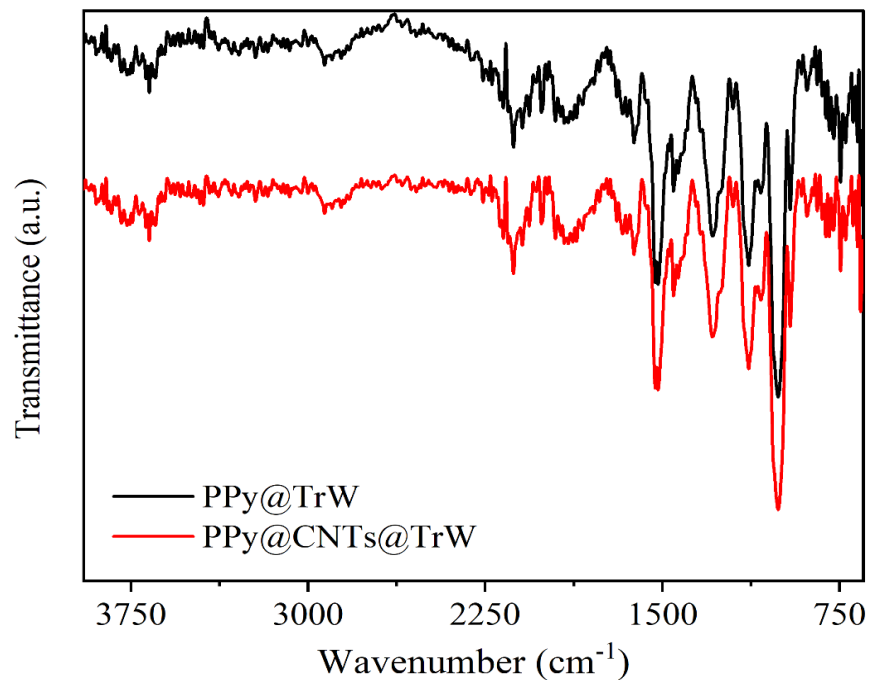
**Figure S1.** A and B) CO<sub>2</sub> adsorption-desorption isotherms of NW and TrW. C) CO<sub>2</sub> adsorption isotherm by ultra-micropores of NW and TrW. D) DFT micropores size distribution of TrW over the range of 0-60 and 0-6 nm diameter. E and F) full scale and detailed FTIR plots in the region of 1200-1800 cm<sup>-1</sup> wavenumber of NW, TrW, and CNTs@TrW.

**Table 1.** Comparison of BET surface area and average pore diameter of NW and TrW.

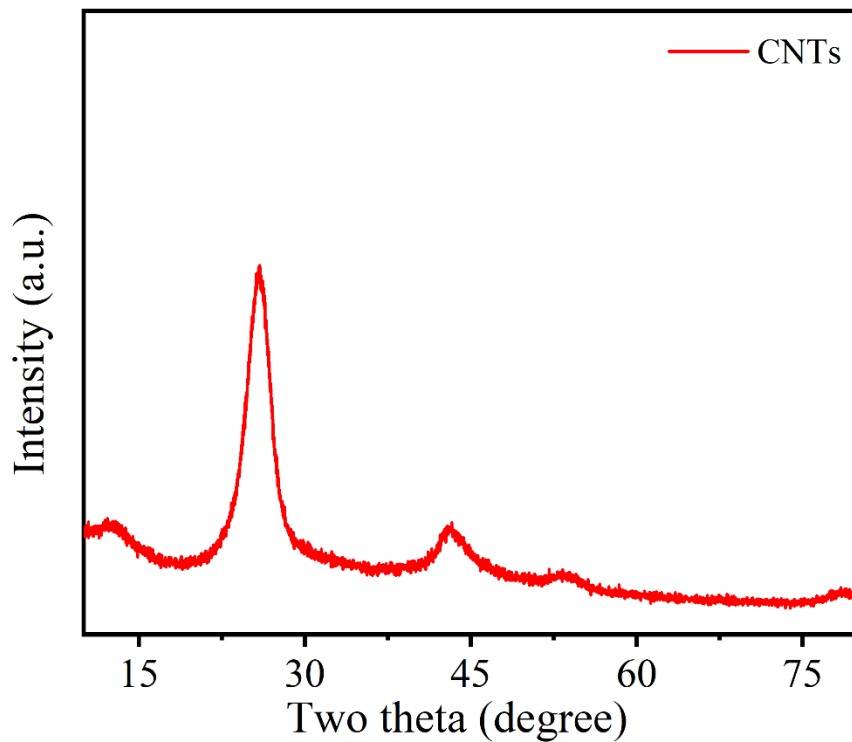
Sample	BET surface area (m <sup>2</sup> /g)	Average pore diameter by BET (nm)
NW	44.65	7.97
TrW	54.83	6.08

**Table 2.** Atomic concentrations and surface lignin percentages in NW and TrW samples were analyzed through XPS.

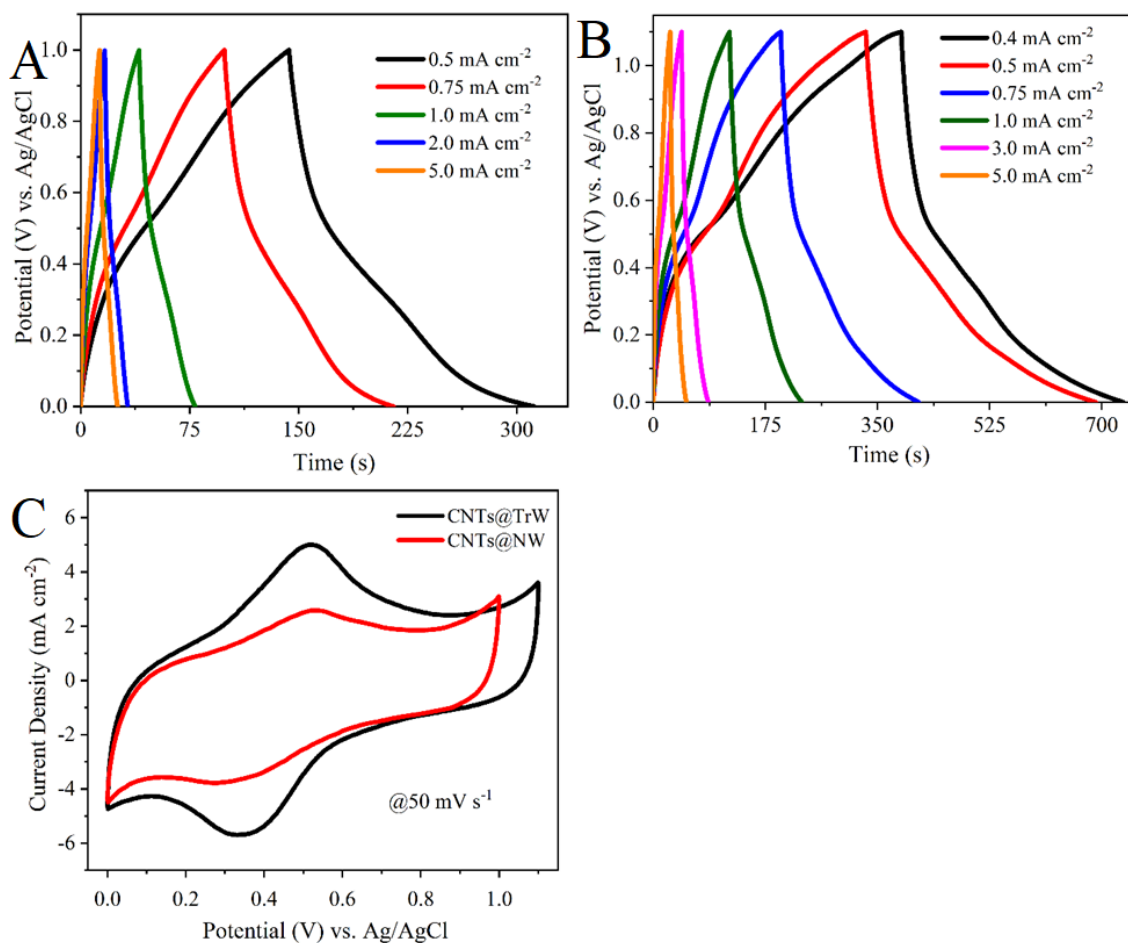
Sample	Atomic Conc. (%)			O/C	Atomic Concentration (%)							C1/C2	Surface lignin (%)
	C	O	N		C1	C2	C3	C4	O1	O2	O3		
NW	74.9	23.8	0.89	0.318	62.6	27.7	9.6	0.05	51.5	48.5	0	2.26	100
TrW	73.7	23.4	1.09	0.317	64.6	27.2	6.4	1.8	46.0	34.4	19.6	2.37	100



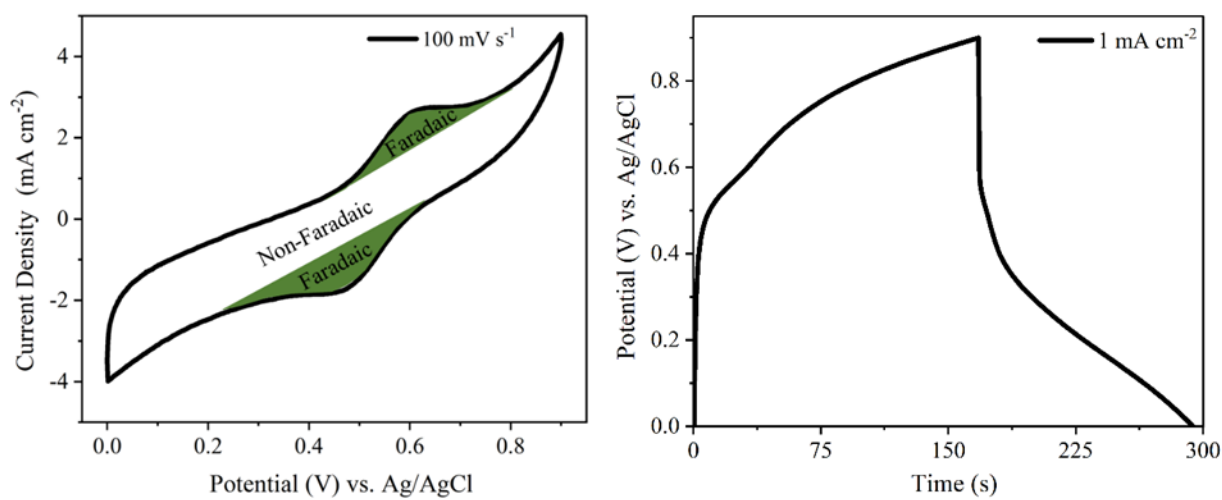
**Figure S2.** FTIR of PPy@TrW and PPy@CNTs@TrW.



**Figure S3.** XRD graph of carboxylated CNTs.



**Figure S4.** GCD profile of CNTs@NW and CNTs@TrW, followed by CV comparison of CNTs@NW and CNTs@TrW.



**Figure S5.** CV and GCD profile of PPy@TrW showing distinct redox peaks.