Supporting Information

Sodium storage with high plateau capacity in nitrogen doped carbon derived from melamine-terephthalaldehyde polymers

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Table S1. Elemental composition as determined from combustive elemental analysis (CEA) and energy-dispersive X-ray spectroscopy (EDX). All the values are gravimetric.

Name	N [%]		C [%]		H [%]		O [%]	
MT mixture*	25.68		55.04		4.62		14.66	
MT fully condensed polymer*	30.75		65.93		3.32		0	
	CEA	EDX	CEA	EDX	CEA	EDX	CEA	EDX
MT-150	34.675	N/A	48.63	N/A	4.62	N/A	14.585	N/A
MT-600	35.455	28.85	54.075	67.84	2.6	0	8.69	3.31
MT-800	17.645	26.43	68.245	70.67	1.39	0	10.165	2.90
MT-1000	9.395	12.05	75.865	82.92	0.88	0	8.89	5.03

*calculated

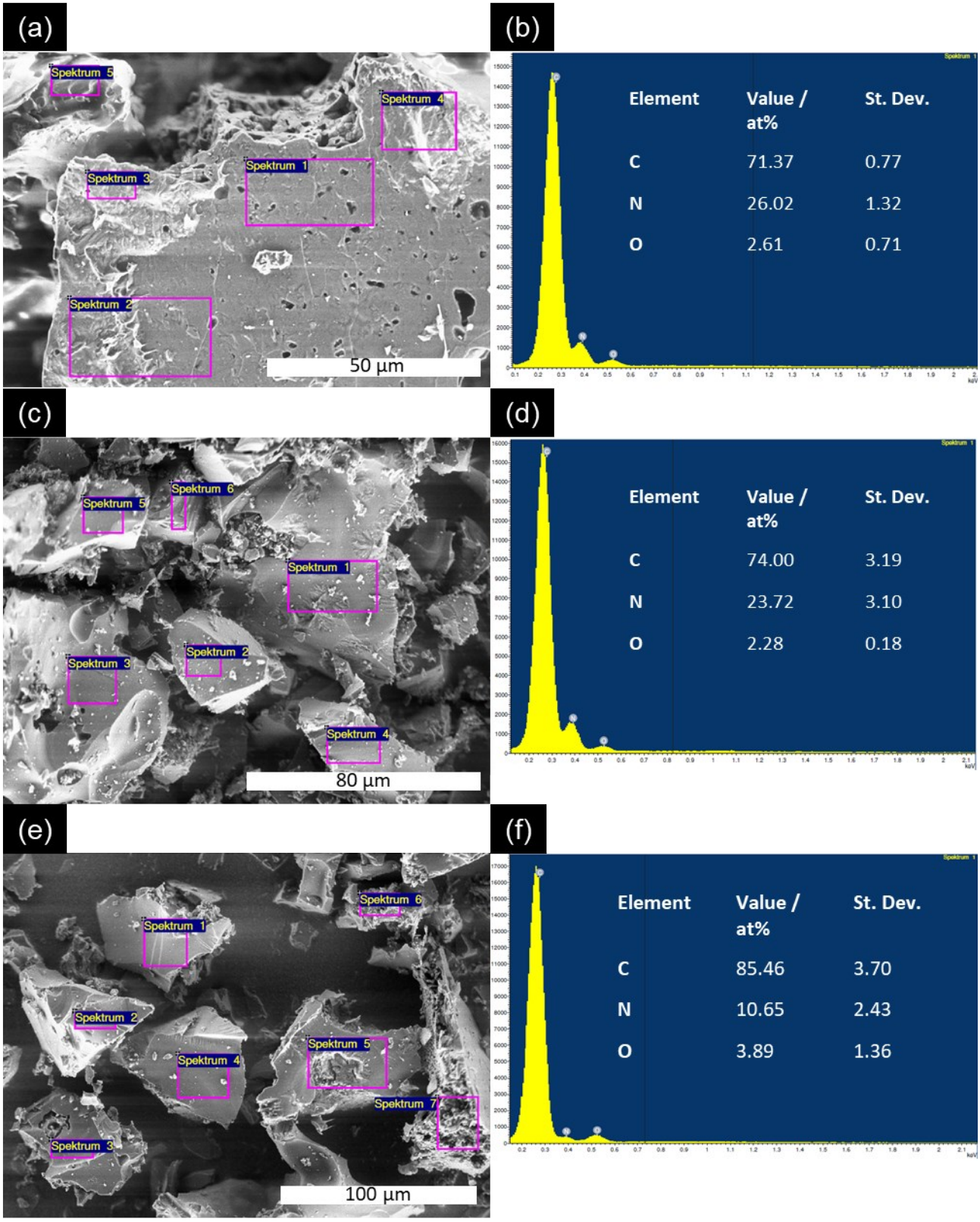

Figure S1. Energy-dispersive X-ray spectroscopy (EDX) analysis of (a,b) MT-600, (c,d) MT-800, and (e,f) MT-1000. Image of (a,c,e) the analysed samples and (b,d,f) corresponding spectra are shown.

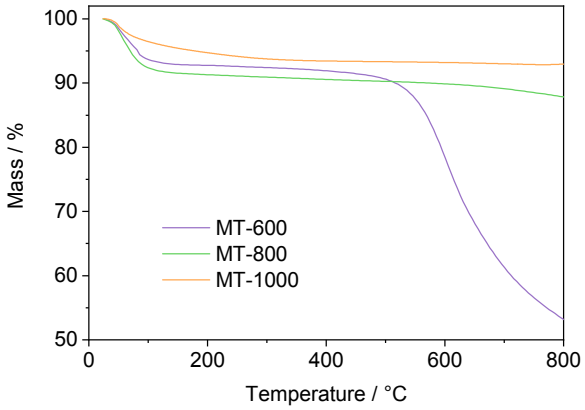

Figure S2. Thermogravimetric analysis (TGA) of MT-600, MT-800 and MT-1000 under nitrogen atmosphere.

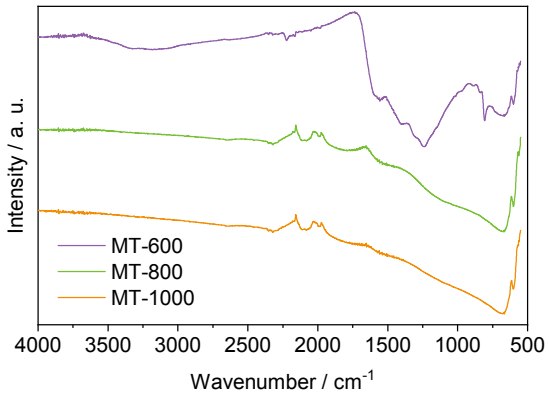

Figure S3. Infrared spectra of MT-600, MT-800 and MT-1000.

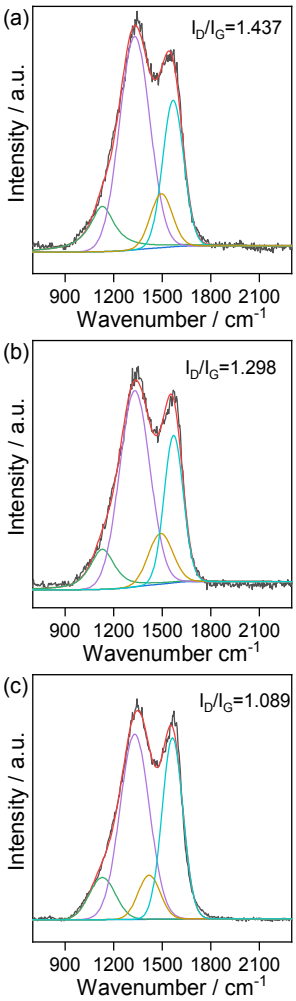

Figure S4. Raman spectra of MT-600 (a), MT-800 (b) and MT-1000 (c).

Table S1. Specific Surface Area (SSA) calculated via the BET equation, total pore volume (V_t), Obtained from N_2 and CO_2 Physisorption Isotherms.

Name	*SSA* N_2 / $m^2\ g^{-1}$	V_t N_2 / $cm^3\ g^{-1}$	V_t CO_2 / $cm^3\ g^{-1}$
MT-600	1.8	0.019	0.069
MT-800	9.4	0.049	0.094
MT-1000	11.2	0.036	0.048

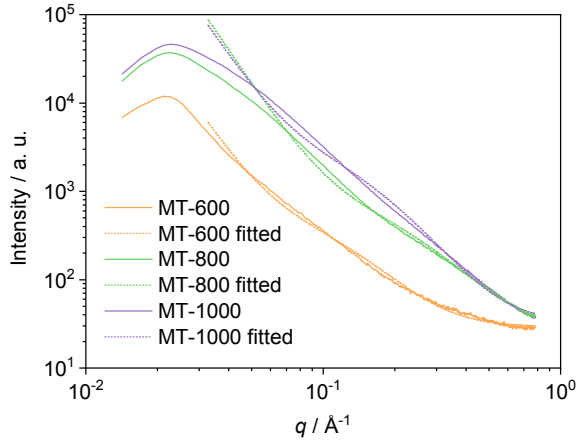

Figure S5. SAXS curves fitted to the pore-matrix approximation.

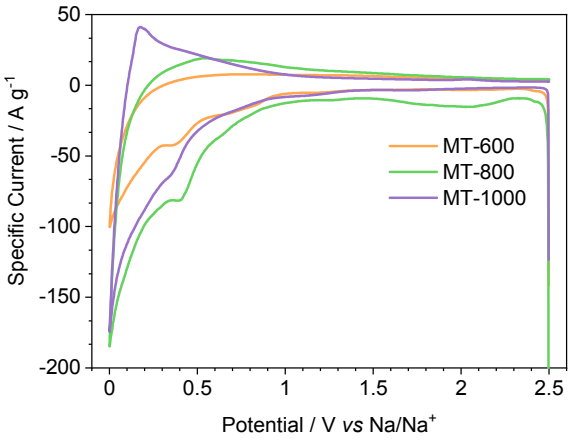

Figure S6. First cycle of cyclic voltammetry of MT-600, MT-800 and MT-1000 at the scan rate of 0.1 mV s^{-1}.

Derivation of sodiation curves

The experimental measurements necessarily contain background noise which makes such data unsuitable for numerical derivation. Therefore all the curves were smoothened prior to derivation, namely using Adjecent Average method with 100 points of window. Afterwards, the first numerical derivative was taken and the borders were determined for every material separately. For these materials suitable border range was 0.0005 of the first derivative. Lower border signifies the beginning of the plateau while the upper one signifies the end of the plateau and the beginning of sodium plating. All the calculations were performed using Origin plotting package.

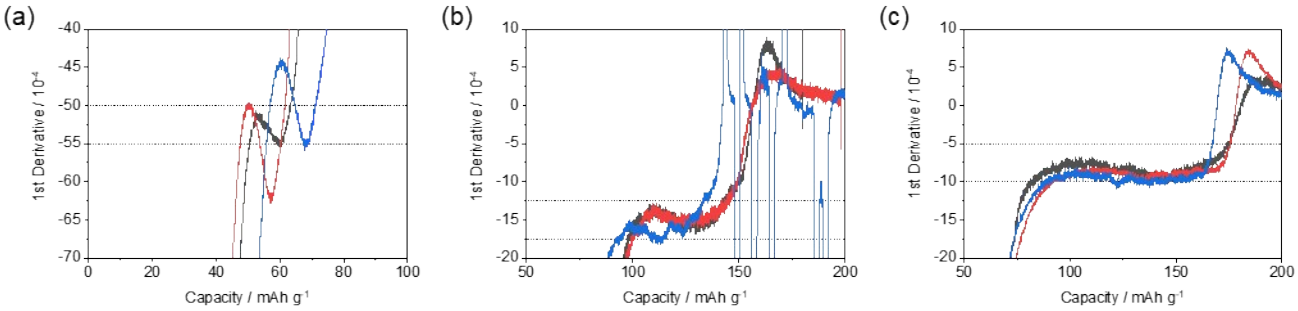

Figure S7. First derivation of dipped sodiation curves of (a) MT-600, (b) MT-800, and (c) MT-1000 at current density C/20. Lower dotted line signifies the beginning of the plateau while the upper one signifies the end of the plateau and the beginning of sodium plating.

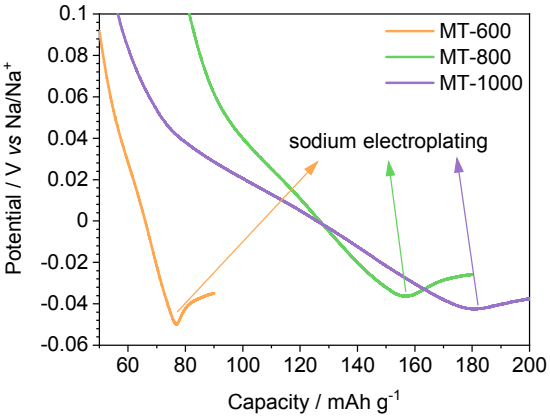

Figure S8. Magnification of electroplating presented in Figure 4d.

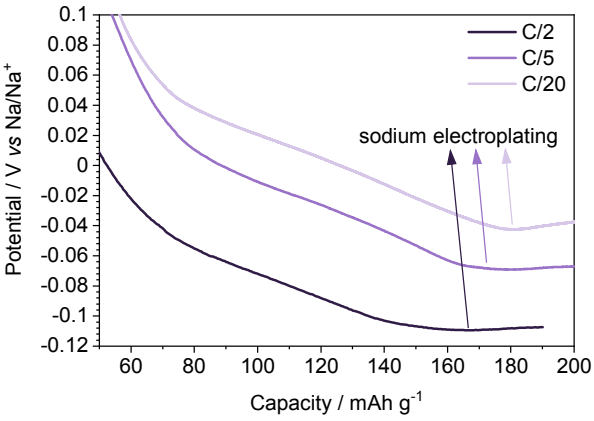

Figure S9. Magnification of electroplating presented in Figure 5a.

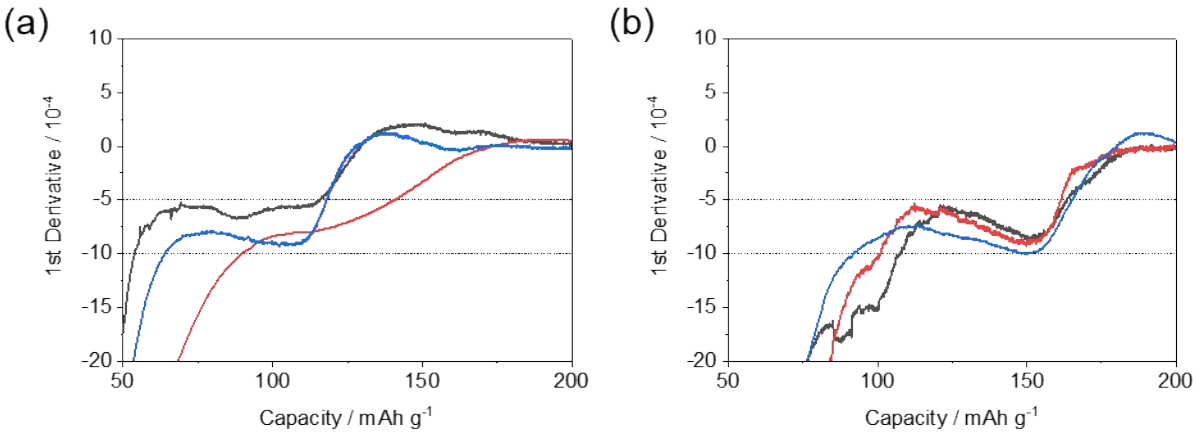

Figure S10. First derivation of dipped sodiation curves of MT-1000 at current densities C/2 (a) and C/5 (b). Lower dotted line signifies the beginning of the plateau while the upper one signifies the end of the plateau and the beginning of sodium plating.

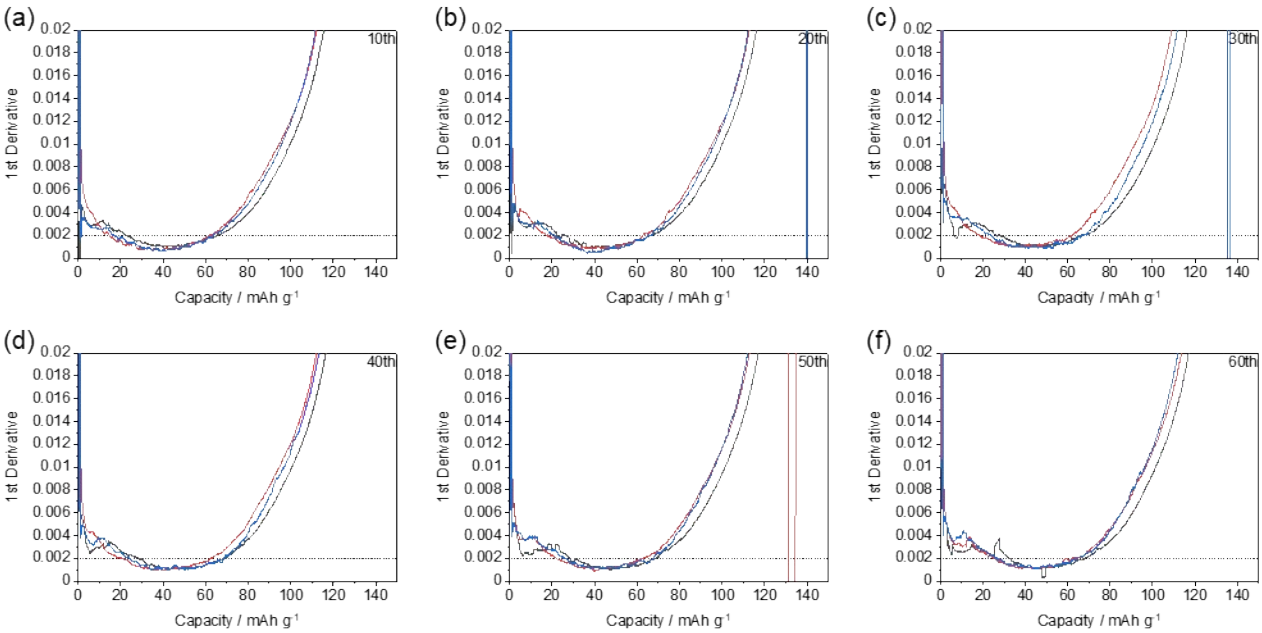

Figure S11. First derivation of desodiation curves of MT-1000 cycled for 60 cycles at current density C/5 with sodiation limit of 139 mAh g^{-1} and desodiation limit of 2.5 V. Dotted line signifies the end of the plateau. (a) 10th, (b) 20th, (c) 30th, (d) 40th, (e) 50th, and (f) 60thcycle are shown.

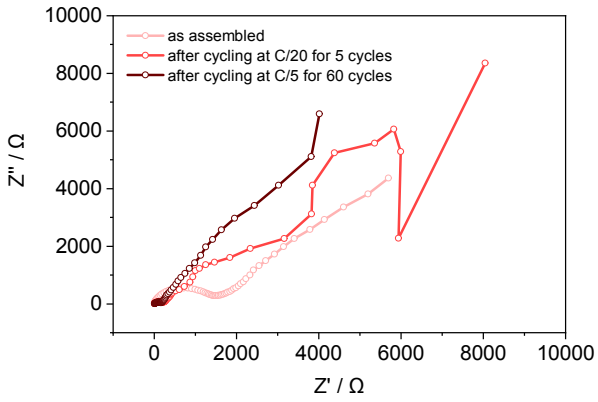

Figure S12. Nyquist plot of a cell that underwent long term cycling.

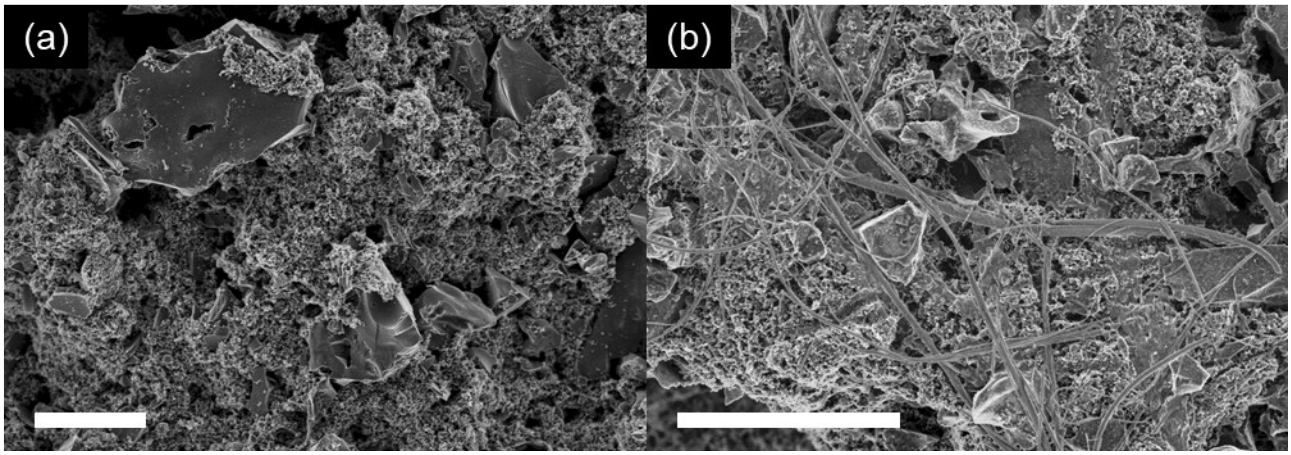

Figure S13. MT-1000 incorporated in the electrode (a) before any electrochemical experiments and (b) after 5 cycles at current density C/20 followed by 60 cycles at current density C/5. The bar represents 20 µm.