Supporting Information

High Ion Adsorption Densities of Site-selective Nitrogen Doped Carbon Sheets Prepared from Natural Lignin

Yosuke Ishii[a, *], Koki Ishigame[a], Yusuke Kido[a], Yuichiro Kato[a], Kengo Yamamoto[a], Kento Sagisaka[b], Yoshiyuki Hattori[b], Ayar Al-zubaidi[a], Kohei Kondo[a] and Shinji Kawasaki[a, *]

[a] Department of Life Science and Applied Chemistry, Nagoya Institute of Technology, Gokiso-cho, Showa-ku, Nagoya 466-8555, Japan.

[b] Department of Chemistry and Materials, Faculty of Textile Science and Technology, Shinshu University, 3-15-1 Tokida, Ueda 386-8567, Japan.

[*] Corresponding author. E-mail: ishii.yosuke@nitech.ac.jp kawasaki.shunji@nitech.ac.jp

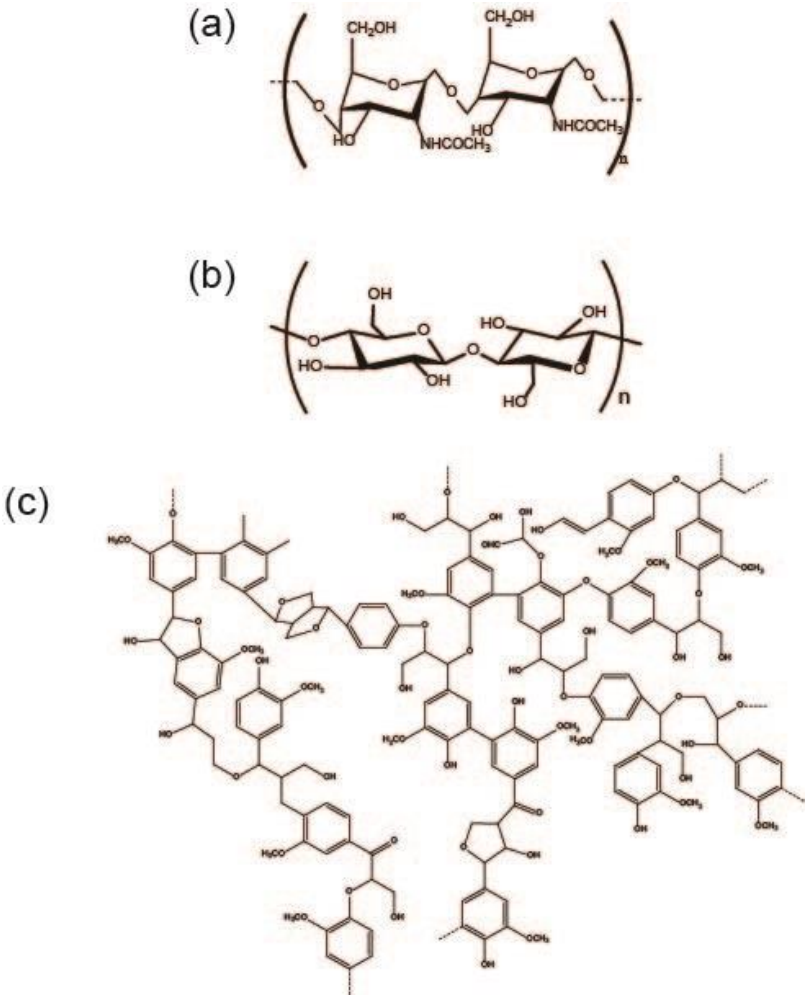

Figure S1. Molecular structure of (a) chitin and (b) cellulose. (c) Molecular model of lignin.[S1]

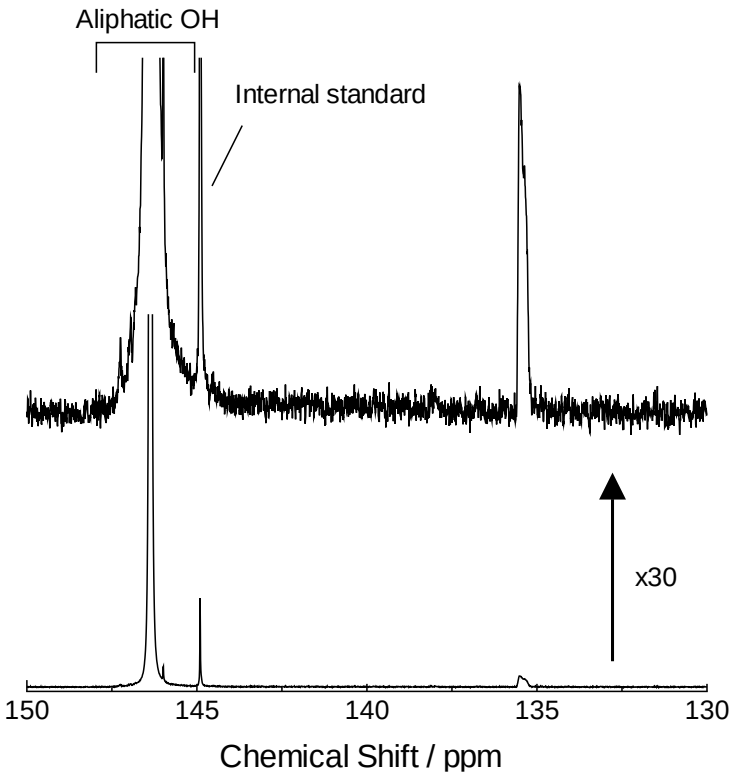

Figure S2. ^{31}P NMR spectrum of the lignin sample.

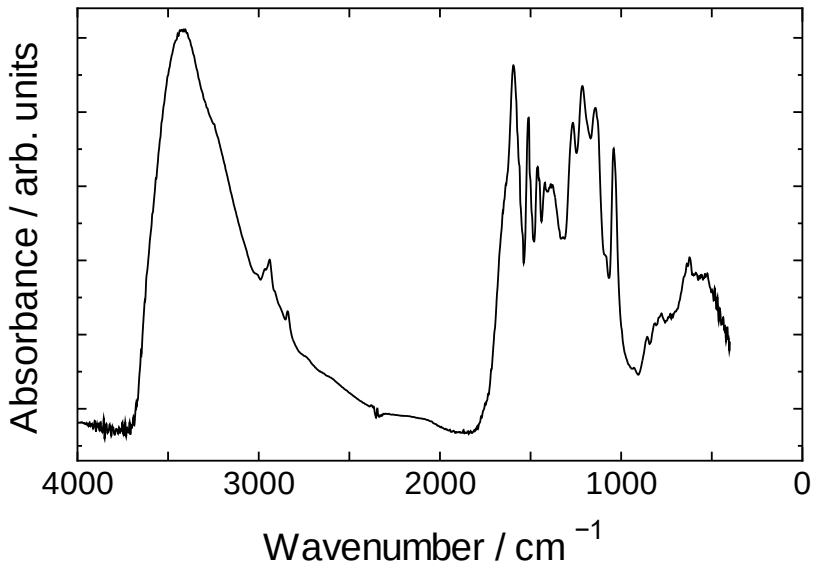

Figure S3. FTIR spectrum of the lignin sample.

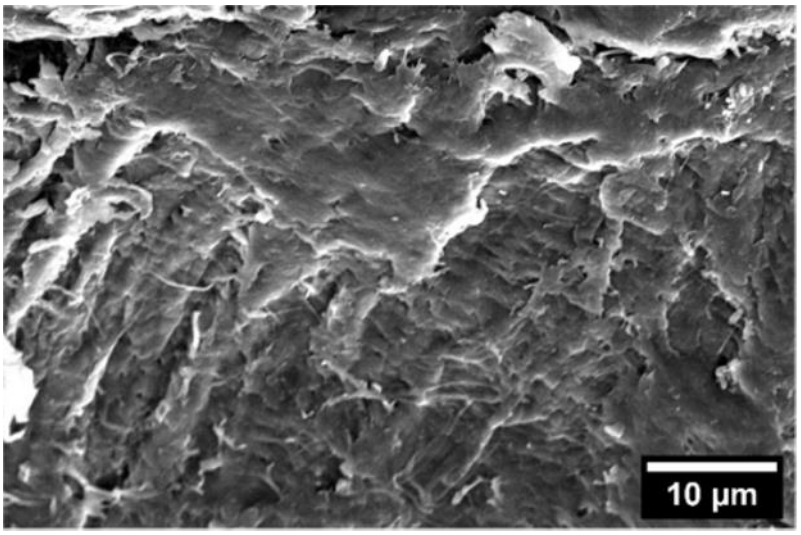

Figure S4. SEM image of carbonized lignin sample without pre-treatments.

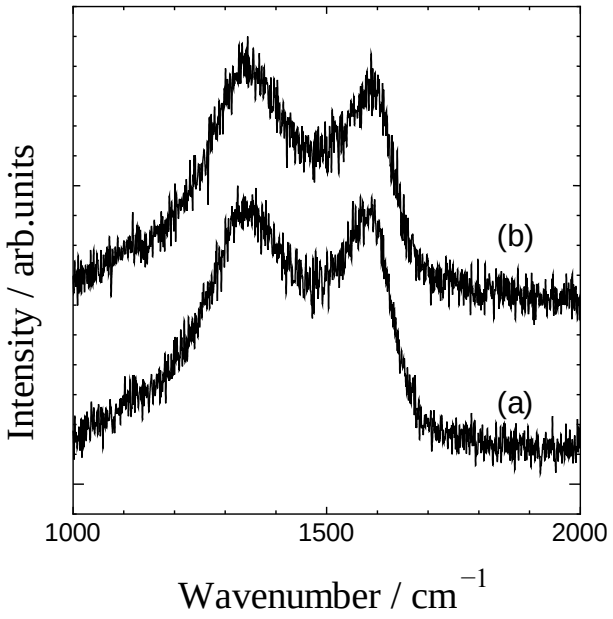

Figure S5. Raman spectra of (a) Lignin-C and (b) N-Lignin-C samples.

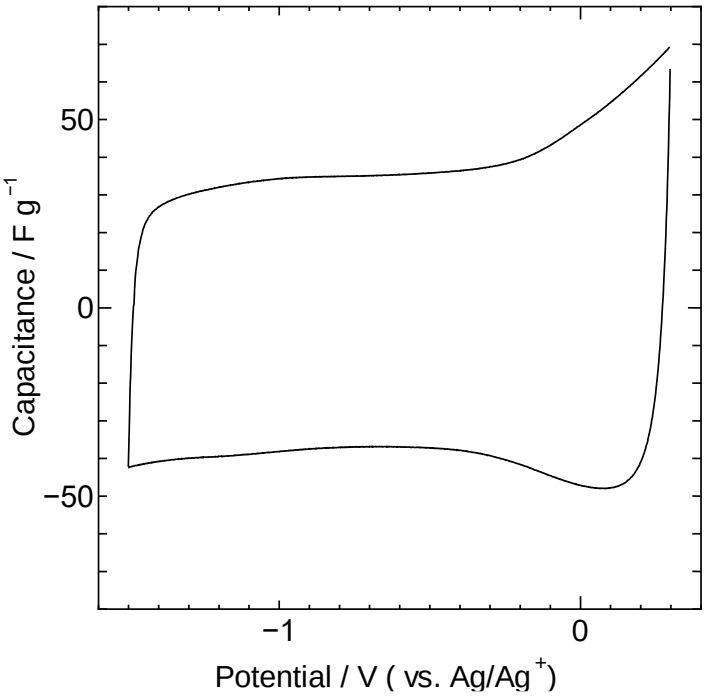

Figure S6. CV curve of Cellulose-C sample measured at a potential sweep rate of 5 mV/s in organic electrolyte.

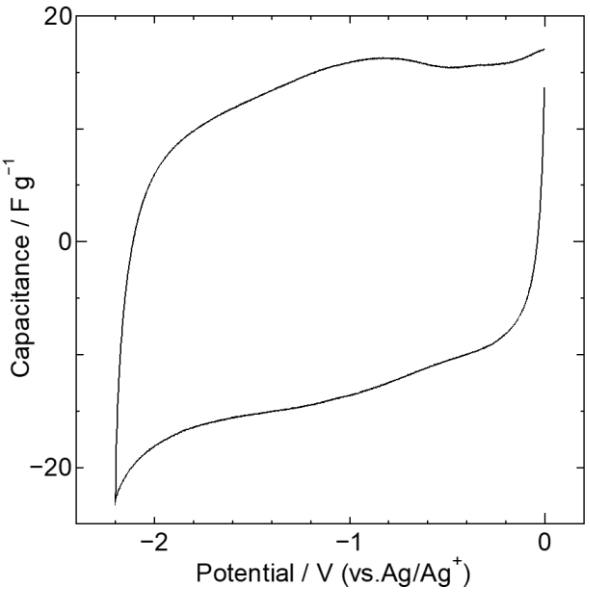

Figure S7. CV curve of Lignin-C sample measured at a potential sweep rate of 5 mV/s in organic electrolyte.

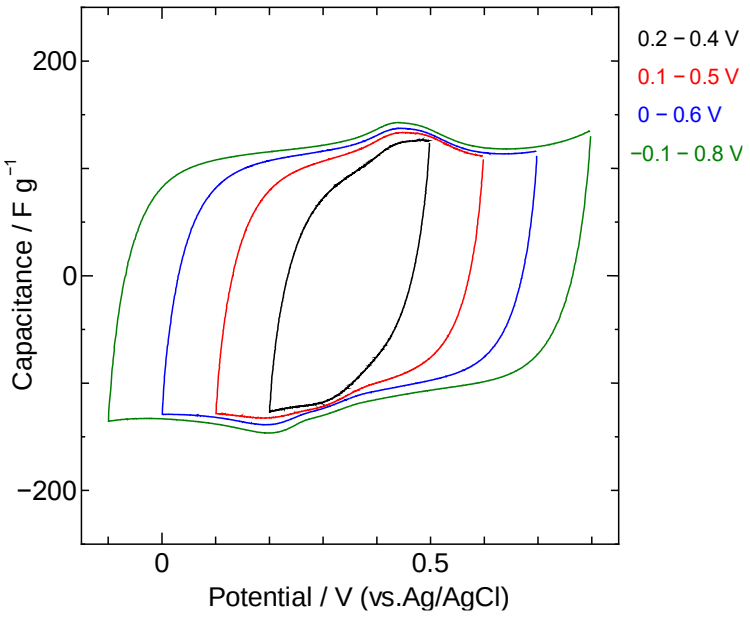

Figure S8. CV curves of N-Lignin-C sample measured at a potential sweep rate of 5 mV/s in 1M H_2SO_4 aqueous electrolyte with increasing potential window.

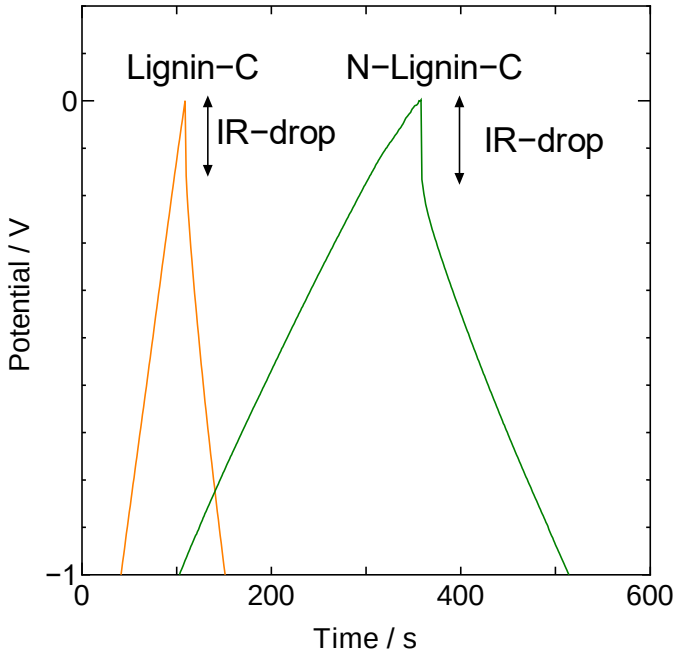

Figure S9. Charge-discharge curves of Lignin-C and N-Lignin-C in 1M TEMA-BF_4/PC electrolyte at current density of 50 mA/g. IR-drop values shown in the graph are almost the same for the two samples.

References

[S1] D. Watkins *et al. J. Mater. Res. Tech.* **4**, 26-32 (2015).