

Supplementary Information for

Bacterial nanocellulose from *Komagataeibacter Medellinensis* in fique juice for activated carbons production and its application for supercapacitor electrodes

Juliana Villarreal-Rueda ¹, Zulamita Zapata-Benabithe ^{2,*}, Laia Posada ³, Estefanía Martínez ³, Sara Herrera ³, Stiven López ³, Ana BJ Sobrido ⁴, Cristina I. Castro³

¹ Semillero de Termofluidos y Conversión de la Energía, Ingeniería Química, Escuela de Ingenierías, Universidad Pontificia Bolivariana, Medellín (Colombia)

² Grupo de Energía y Termodinámica, Ingeniería Química, Escuela de Ingenierías, Universidad Pontificia Bolivariana, Medellín (Colombia)

³ Grupo de Investigación sobre Nuevos Materiales, Ingeniería en Nanotecnología, Escuela de Ingenierías, Universidad Pontificia Bolivariana, Medellín (Colombia)

⁴ School of Engineering and Materials Science, Queen Mary University of London, London, United Kingdom

*zulamita.zapata@upb.edu.co

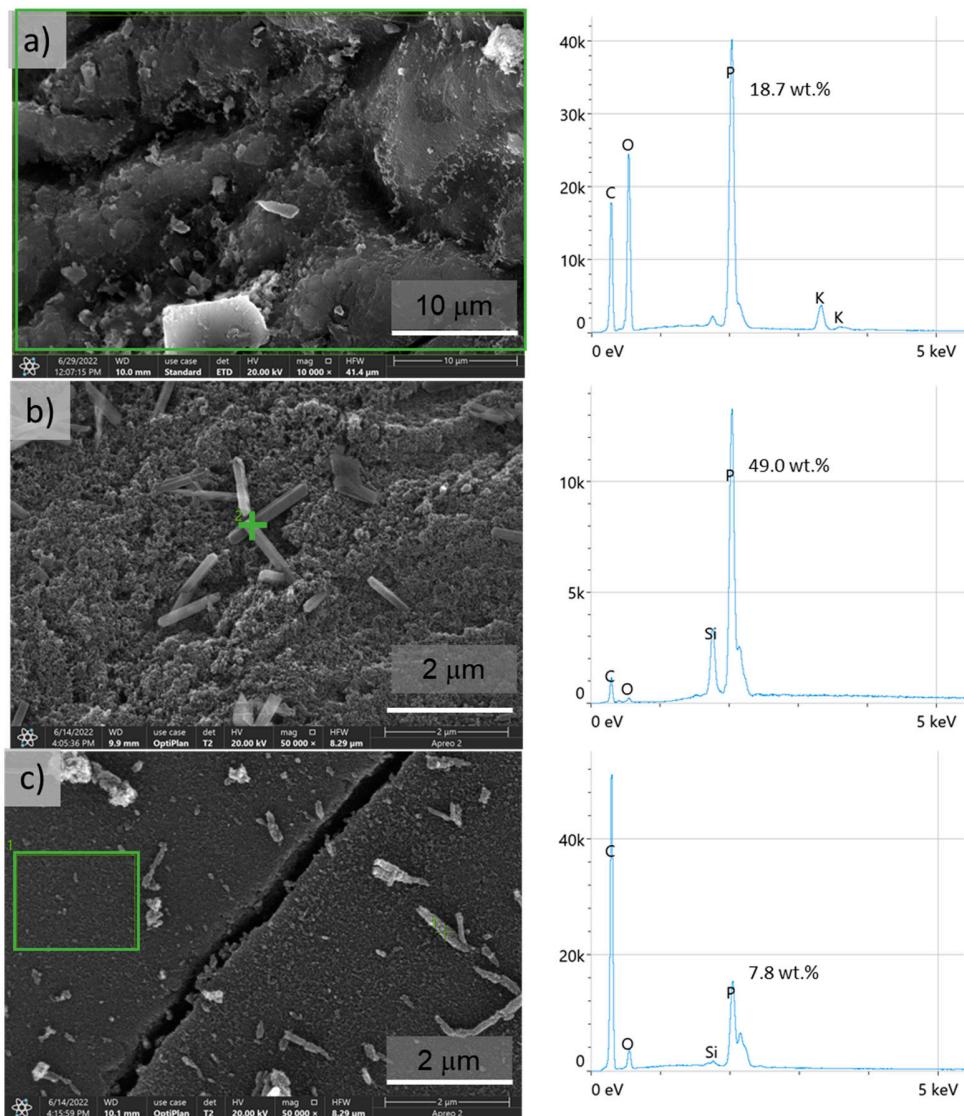


Figure S1. SEM images and EDX spectra of BNCA-P at 500 °C X10000 (a) and 600 °C X50000 (b and c).

Table S1. Binding energies of functional groups of XPS high-resolution spectra C_{1s}, O_{1s}, and P_{2p}.

C _{1s} [1, 2]		O _{1s} [1, 3]		P _{2p} [3]	
B.E. (eV)	Functional group	B.E. (eV)	Functional group	B.E. (eV)	Functional group
284.6	C=C	530.5	Quinone C=O	132.2	C ₃ -PO
285.3	C-C sp ³ aliphatic	531.3	O=C + O=P	133.5	C-PO ₃ o C ₂ -PO ₂
287.5	R-OH and C-O-C and/or C-O-P	532.4	O-C + COH + C-O-C + P-O	134.5	C-O-P, (CO) ₃ PO, (CO) ₂ PO ₂ and (CO)PO ₃
286.3	C=O + >C=O	533.3	C-OH and/or P-O- P		
289.3	-C(O)-O-C	534.5	Oxygen chemisorb and H ₂ O		
291.6	π-π*				

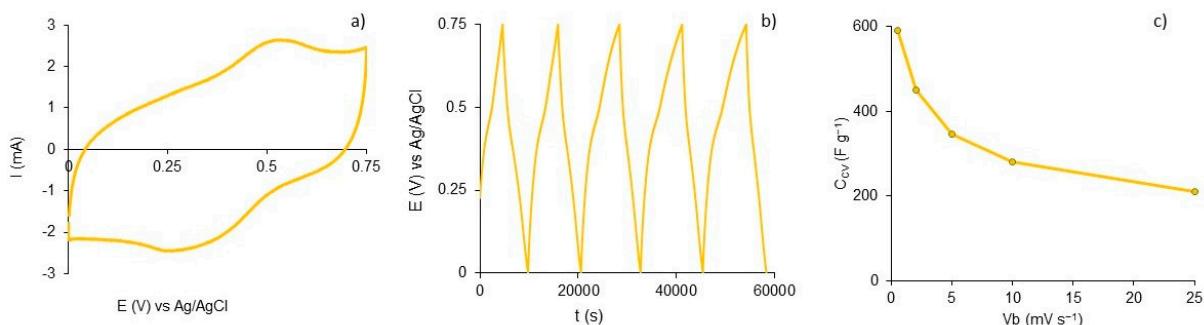


Figure S2. (a) Cyclic voltammetry curves at 0.5 mV s⁻¹, (b) Charge/Discharges curves at 0.125 A g⁻¹, and (c) Capacitance as a function at different scan rates for K700 sample.

References

1. Puziy AM, Poddubnaya OI, Ziatdinov AM (2006) On the chemical structure of phosphorus compounds in phosphoric acid-activated carbon. *Appl Surf Sci* 252:8036–8038
2. Li W, Wang J (2016) Significant enhancement of the cycling performance and rate capability of the P/C composite via chemical bonding (P-C). *J Mater Chem A* 4:505–511
3. Liu Y, Li K, Liu Y, et al (2015) The high-performance and mechanism of P-doped activated carbon as a catalyst for air-cathode microbial fuel cells. *J Mater Chem A* 3:21149–21158