

SUPPORTING INFORMATION

Sustainable, high barrier polyaleuritate/nanocellulose biocomposites

Giacomo Tedeschi ^{1,2,*}, Susana Guzman-Puyol ^{1,3}, Luca Ceseracciu ⁴, José Jesús Benitez ⁵, Pietro Cataldi ⁶, Mark Bissett ⁶, Antonio Heredia ³, Athanassia Athanassiou ^{1,*}, and José A. Heredia-Guerrero ^{1,3,*}

¹ Smart Materials, Istituto Italiano di Tecnologia, Via Morego 30, Genova, 16163, Italy.

² DIBRIS, Università di Genova, Via Opera Pia 13, Genova, 16145, Italy.

³ IHSM La Mayora, Departamento de Mejora Genética y Biotecnología, Consejo Superior de Investigaciones Científicas, E-29750 Algarrobo-Costa, Málaga, Spain.

⁴ Materials Characterization Facility, Istituto Italiano di Tecnologia, Via Morego 30, Genova, 16163, Italy.

⁵ Instituto de Ciencia de Materiales de Sevilla, Centro Mixto CSIC-Universidad de Sevilla, Calle Americo Vespucio 49, Isla de la Cartuja, Sevilla 41092, Spain.

⁶ Department of Materials and National Graphene Institute, University of Manchester, Oxford Road, Manchester, M139PL, UK.

* Corresponding authors: giacomo.tedeschi@iit.it, athanassia.athanassiou@iit.it, ja.heredia@csic.es

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Liquid	γ_l (mN/m)	γ_l^{nd} (mN/m)	γ_l^d (mN/m)
Water	72.8	51.0	21.8
Diiodomethane	50.8	0.0	50.8

Table S1. Surface tension components of three liquids used in the calculation of the surface energy components.

Sample	Thickness (μm)
CNF-0	775 ± 3
CNF-0.25	805 ± 7
CNF-0.5	785 ± 2
CNF-1	789 ± 7

Table S2. Thickness values for polyaleururate/cellulose nanofibrils biocomposites, with average values and standard deviation.

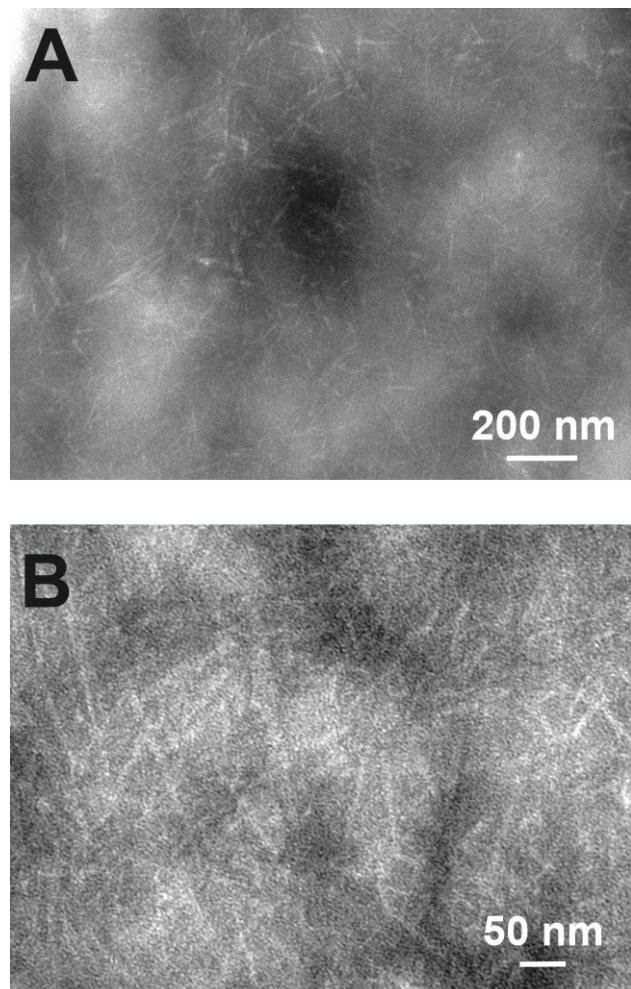


Figure S1. TEM images of cellulose nanofibrils used in this work at two different magnifications, **(A)** scale bar = 200 nm, and **(B)** scale bar = 50 nm, respectively.

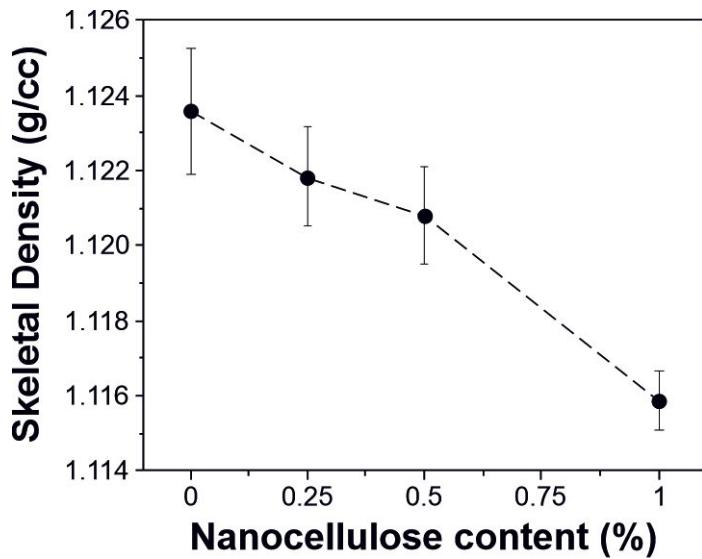


Figure S2. Skeletal density values for polyaleururate/cellulose nanofibrils biocomposites.

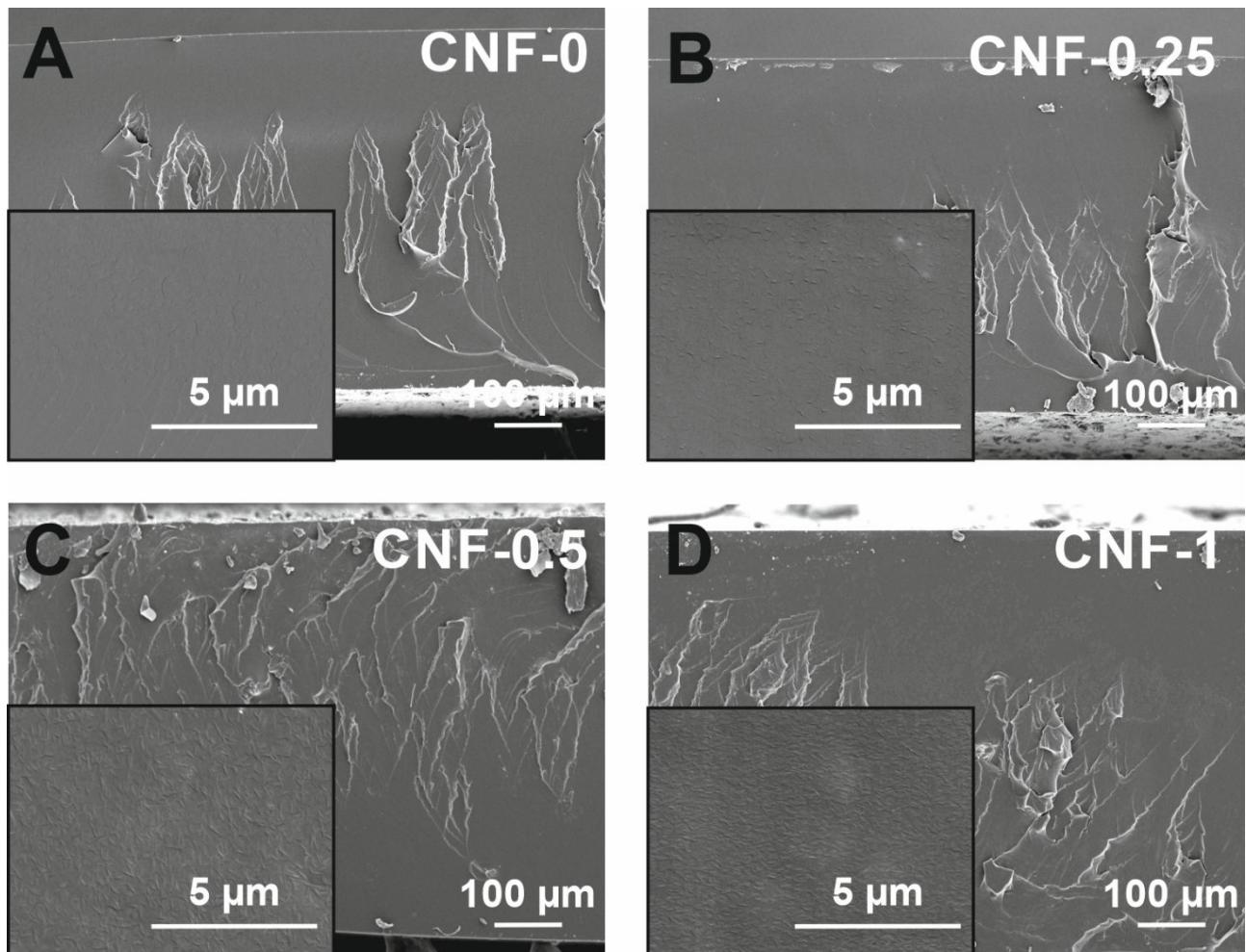


Figure S3. Cross-section SEM images of control polyaleurite samples CNF-0 (**A**) and of cellulose nanofibrils-based biocomposites (**B, C, D**), respectively (scale bar = 100 μm). Insets: cross-section at higher magnification (scale bar = 5 μm).

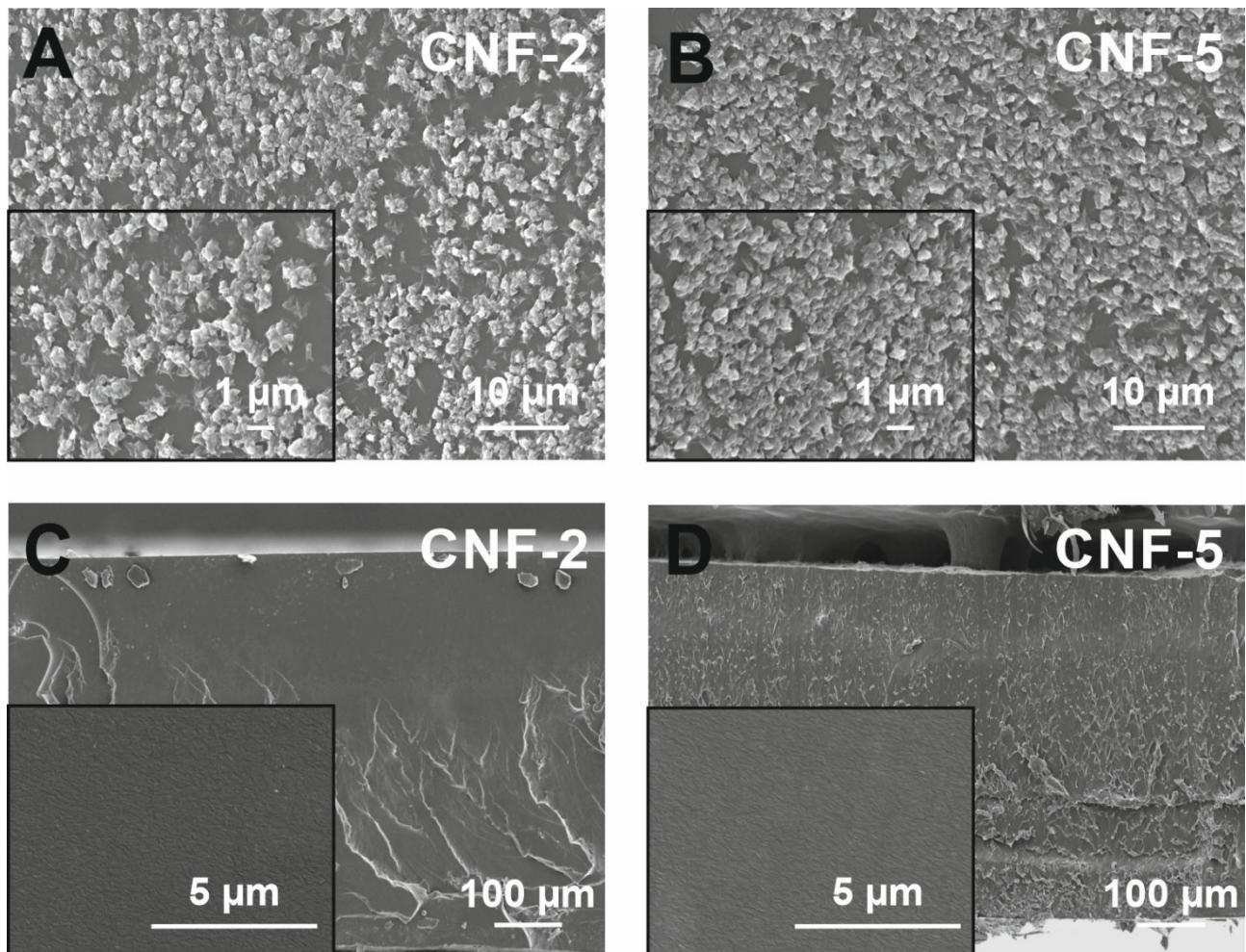


Figure S4. Top-view (**A, B**) and cross-section (**C, D**) SEM images of CNF-2 and CNF-5, respectively (scale bar = 10 and 100 μm). Insets: cross-section at higher magnification (scale bar = 1 and 5 μm).

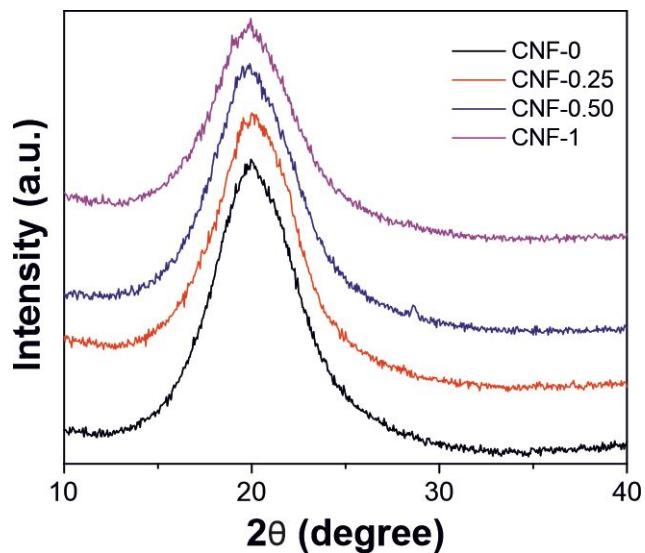


Figure S5. X-ray diffraction (XRD) patterns of polyaleururate/cellulose nanofibrils biocomposites.

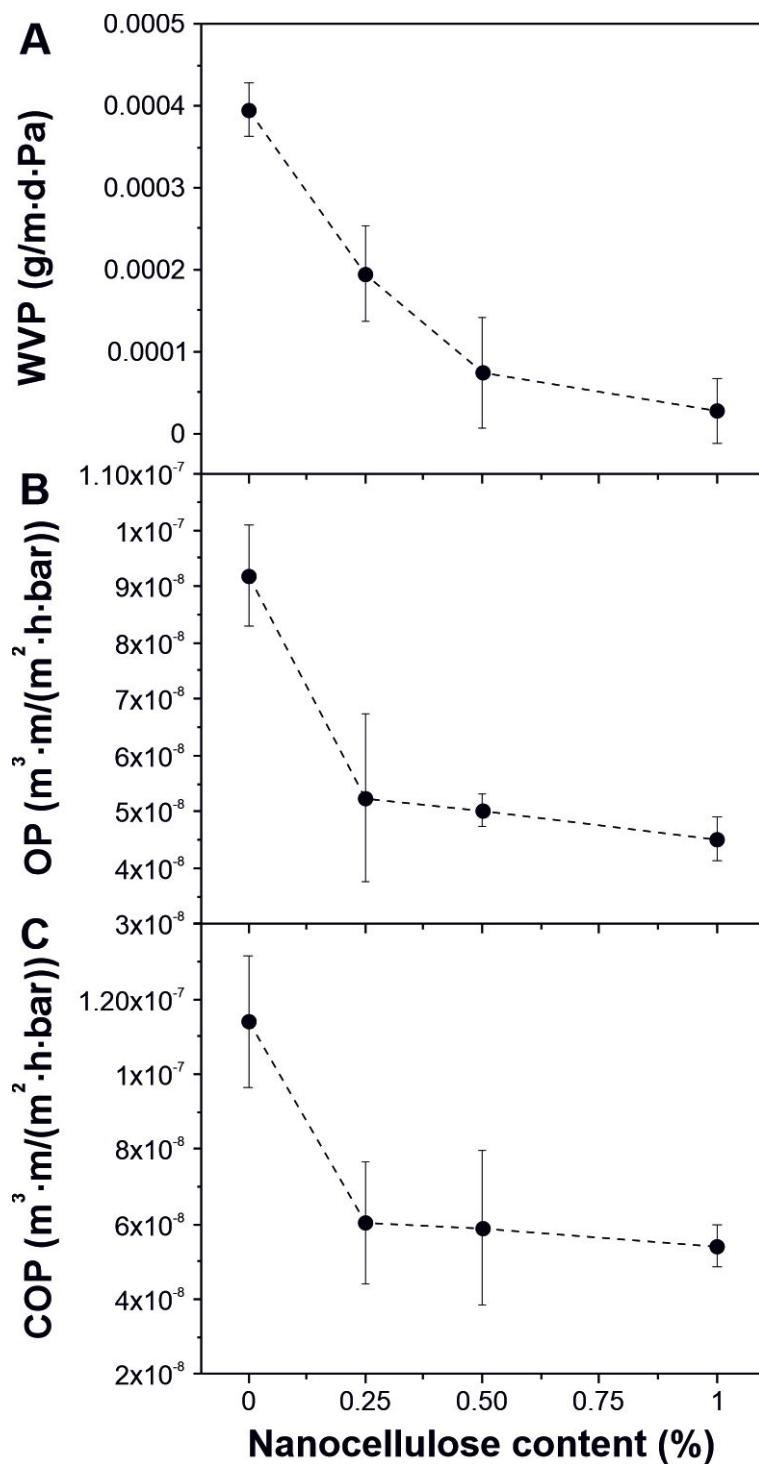


Figure S6. **(A)** Water Vapor Permeability (WVP), **(B)** Oxygen Permeability (OP) and **(C)** Carbon Dioxide Permeability (COP) of all the polyaleuritate/cellulose nanofibrils biocomposites.