

Is there a peculiar physics of biobased polymers?

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The conversion of biomass into useful biobased polymers and composites has considerable economic and environmental value due to a growing demand for environmentally friendly plastics in a sustainable development, particularly in times of global warming and diminishing petroleum oil reserves. After the first steps of biopolymers' synthesis have been fulfilled, there are still important issues related to biopolymers processing, which must be addressed so that acceptable physical properties can be reached and applications found. To this respect it is legitimate to wonder whether biobased polymers can have a peculiar physics, i.e., will be processable, have similar physical properties, durability and lead to the same kind of applications as petroleum based polymers. A good understanding of bioplastics, biocomposites or nanobiocomposites' (Figure 1) physics and engineering is the key for promising applications in automotive [1], packaging [1], electronics [2] or medicine [2].

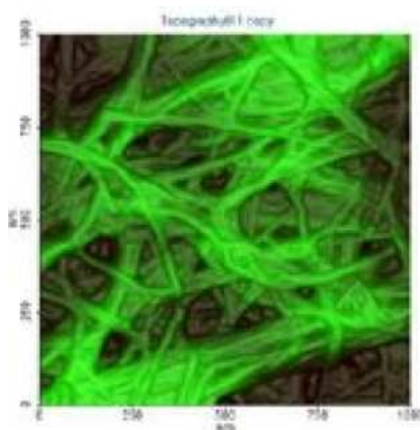


Figure 1: Bambou nanofibres observed by AFM

References:

1. R. P. Wool, X. S. Sun, Biobased polymers & Composites, 2005, Elsevier, London, 1-620.
2. J. F. Feller, B. Kumar, M. Castro, Nanocomposites with biodegradable polymers: Synthesis, Properties & Future Perspectives - Chap. 15: Conductive biopolymer nanocomposites for sensors, 2011, Ed. V. Mittal, Oxford University Press, Oxford, UK, 368-399.