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Magnetic Bacterial Cellulose and Carbon Fiber Nanocomposites

Friday 24 June 2022 09:00 (30 minutes)

In this talk, I will present my ongoing research on the theme of bacterial cellulose nanocomposites. Bacterial cellulose (BC) is a natural polymer with a three-dimensional network of nanofibers. It is produced by cultivation of certain types of bacteria strain. The structure and properties of BC are very unique. It exhibits remarkable mechanical properties, porosity, water absorbency, moldability, biodegradability, and excellent biological affinity. Moreover, it possesses highly porous nanostructure with very high surface area, which makes it an ideal substrate to host other nanomaterials. Several types of nanoparticles have been incorporated in BC to improve the characteristics and properties. In my group, we have focused on impregnation of various kinds of magnetic nanoparticles in BC to make flexible magnetic membranes, which can be utilized for several applications, such as actuators, sensors, electromagnetic shielding, information storage, and anti-counterfeit materials. Furthermore, by pyrolysis, BC transforms into carbon nano-sponge, which can be used for heavy metal adsorption or oil adsorption. I will summarize the work I have been doing in the past 4 years, and an outlook for the future work.

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