**Black is the New Green**

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***Abstract***

Trees are crucial to humankind's survival, releasing the oxygen we breathe, growing the fruits we eat and supplying wood to build and warm our shelters. Heating wood at 300-1000 °C with little or no oxygen creates wood biochar - a carbonaceous product. Monolithic wood biochar (MWB) has a continuous carbon matrix and morphological features that resemble those in a tree, such as the xylem and phloem that transport water from the root and deliver sugars from leaves to individual cells. Structurally and chemically, MWB belongs to nanoporous carbons (NPCs) consisting of carbon nanotubes and reduced graphene oxides. As functional materials, NPCs have been explored for applications essential to sustainability, including electrical energy storage, water purification and CO2 capture. However, the lack of scalable manufacturing technology continues to hinder the large-scale utilization of NPCs despite their demonstrated superiority in enhancing materials performance. Derived from abundant woody biomass with simple processes, MWB offers a new opportunity for overcoming this limitation. This talk presents the recent progress in applying MWB in areas critical to sustainability, focusing on electrical energy storage and water purification. The progress has revealed the potential of MWB as a green, cost-effective and scalable NPC alternative.

***Biography***

**Dr. Charles Q. Jia is a professor in**the Department of Chemical Engineering and Applied Chemistry at the University of Toronto in Canada**, a Fellow of** the Canadian Academy of Engineering and Chemical Institute of Canada, and a Registered Professional Engineer. He obtained a Ph.D. from McMaster University in Canada and an M.Eng. and B. Eng. from Chongqing University in China, served as the President of the Canadian Society for Chemical Engineering (CSChE) in 2020 and wasConference Chair of IACChE/CSChE-2018 in Canada. Dr. Jia directs the Green Technology Lab and leads a group of international researchers addressing global sustainability and climate change challenges. His team's current research focuses on exploring wood biochar's potential as a functional material and developing novel technologies that enable the circular economy while applying carbon and sulphur chemistry.