



BIOCHAR AS A CARBON SEQUESTERING CONSTRUCTION MATERIAL IN CEMENTITIOUS MORTAR

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ABSTRACT

Biochar is widely considered as effective way of sequestering carbon dioxide. The possibility of using it to enhance the mechanical strength and reduce permeability of cement mortar is explored in this study. The effect of fresh biochar and biochar saturated with carbon dioxide a priori on the setting time, mechanical strength and permeability of cement mortar was evaluated. The biochar was prepared from mixed wood saw dust at 300°C and added to mortar during mixing at 2% by weight of cement. It was found that addition of fresh biochar and saturated biochar reduce initial setting time and significantly improve early compressive strength of mortar. The experimental results suggested that biochar addition can impart ductility to mortar under flexure, although flexural strength was not significantly influenced. Water penetration and sorptivity of mortar was significantly reduced due to addition of biochar, which indicate higher impermeability in biochar added mortar. However, it is found that addition of fresh biochar offers significantly higher mechanical strength and improved permeability compared to biochar saturated with carbon dioxide. These results suggest that biochar has the potential to be successfully deployed as a carbon sequestering admixture in concrete constructions that also provides a way to waste recycling.

Date: 31 January 2018 (Wednesday)

Time: 10:30 am – 11:30 am

Venue: Room Z411, 4/F, Block Z,
The Hong Kong Polytechnic University,
181 Chatham Road South,
Hungghom, Kowloon

SPEAKER'S BIOGRAPHY

Associate Professor Kua is the Assistant Dean (Academic) of the School of Design and Environment, and the Leader of the Smart Materials Laboratory of the Department of Building of the National University of Singapore. His research areas are biochar-based building materials and life cycle sustainability assessment of building materials.

He has authored about 100 articles in these areas. He has won more than 60 different international/national academic awards (including several from his alma mater Massachusetts Institute of Technology, MIT). He has been invited by local and international organizations to deliver guest lectures and speeches on his research more than 60 times, including as a plenary speaker at the Forum for Science, Technology and Innovation for Sustainable Development, workshop on Sustainable Consumption and Production, which was organized by the International Council for Science on 11 June 2012, in Rio de Janeiro, Brazil (at Rio+20). He consults for the Singapore Government on environmental issues and has helped set up corporate sustainability guidelines for companies with more than SGD 2 billion in combined annual turnover. He is currently involved in research collaborations with groups in China, USA, Italy, Colombia, South Africa, and Saudi Arabia on various research topics.

*** All Interested Are Welcome ***

For further information, please contact Dr. Dan Tsang at Tel. 2766-6072.

Free Admission. Certificates of attendance will be provided to participants if they attend the whole lecture.