

Title: *Novel Nanobiocomposite Coating For Greenhouse Structures*

Abstract:

Through the use of bionanocomposite coating, it is possible to produce economical greenhouse film that withstand severe chemicals resistant levels and also assure a service life of three or more years even under intense sunlight. Bionanocomposite with nanocrystal cellulose reinforcement has good ultraviolet (UV) blocking power because of such advantages as nontoxicity, chemical stability at high temperature, and permanent stability under UV exposure. The use of this special formulated UV blocker protects greenhouse structures against low-wavelength solar radiation by preventing the oxidation of the polymer chain of organic polymers from the damaging effects of these rays and prolongs its usage. Blocking out the UV will help to hinder a significant part of the visible range of insects. UV-blocking materials have properties to filter the UV radiation (280-400 nm) interfering with the vision of insects and in consequence, their behavior related with movement, host location ability and their population parameters. This novel nanocellulose reinforced polyurethane binder can strongly absorb UV-radiation up to 390 nm. The performance of such stabilized films is also very good when in contact with wood and metal greenhouse structures. The stabilizer is also highly efficient against agrochemicals.



Assoc. Prof. Ir. Dr. Ching Yern Chee has been practicing as a material engineer for the past ten years in polymer industrial. She has obtained her Doctor of Philosophy in Engineering in 2011 from the University of Malaya. Now, she has more than 18 years of experience in the field of Materials Engineering and Polymer Technology in both academia and private industry. She has published more than 80 research articles in various ISI/WoS- and Scopus-listed publications.

Amongst her research achievements include the synthesis and modification of nano-structured materials and biopolymers with enhanced physical, chemical and thermal properties, development of functional nano-materials, and investigation of processes of controlling the self-assembly of nano-structures, with emphasis on thermochemical and thermophysical properties. Assoc. Prof Ir. Dr. Ching has filed numerous intellectual property rights /patents for her inventions and received many accolades as a distinguished scholar. She is filing a few patents, trademarks and copyrights which stem from his specialty research. She has 11 gold awards and 5 Best Invention Awards at international/national exhibitions pertaining to her research and inventions.

Assoc. Prof. Ir. Dr. Ching is a Chartered Engineer with the Engineering Council, UK and a Professional Engineer with the Board of Engineers Malaysia. She is also served as Fellow of 2 prominent professional societies. i.e. The Institution of Mechanical Engineers UK and Institution of Engineers Malaysia