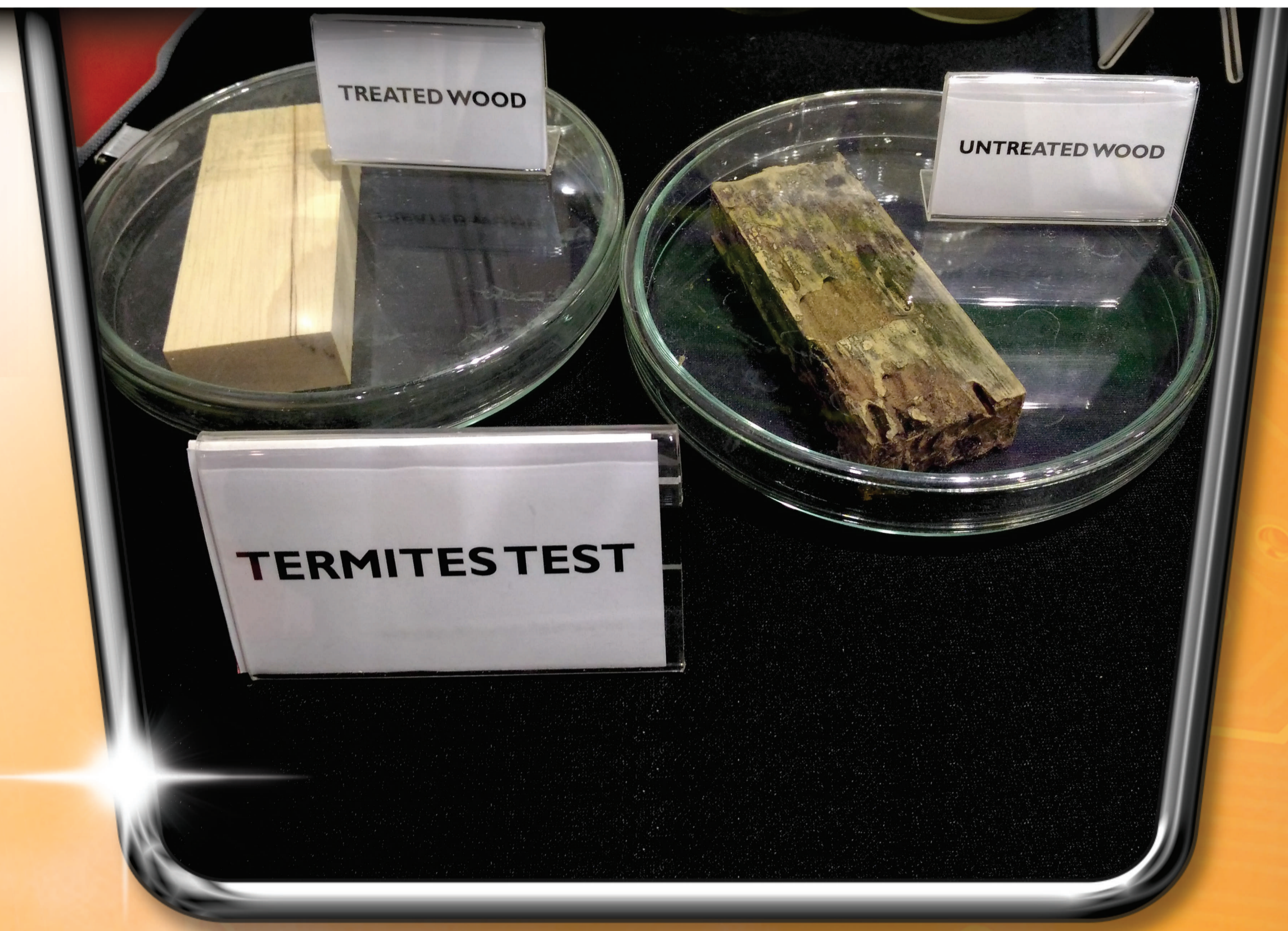


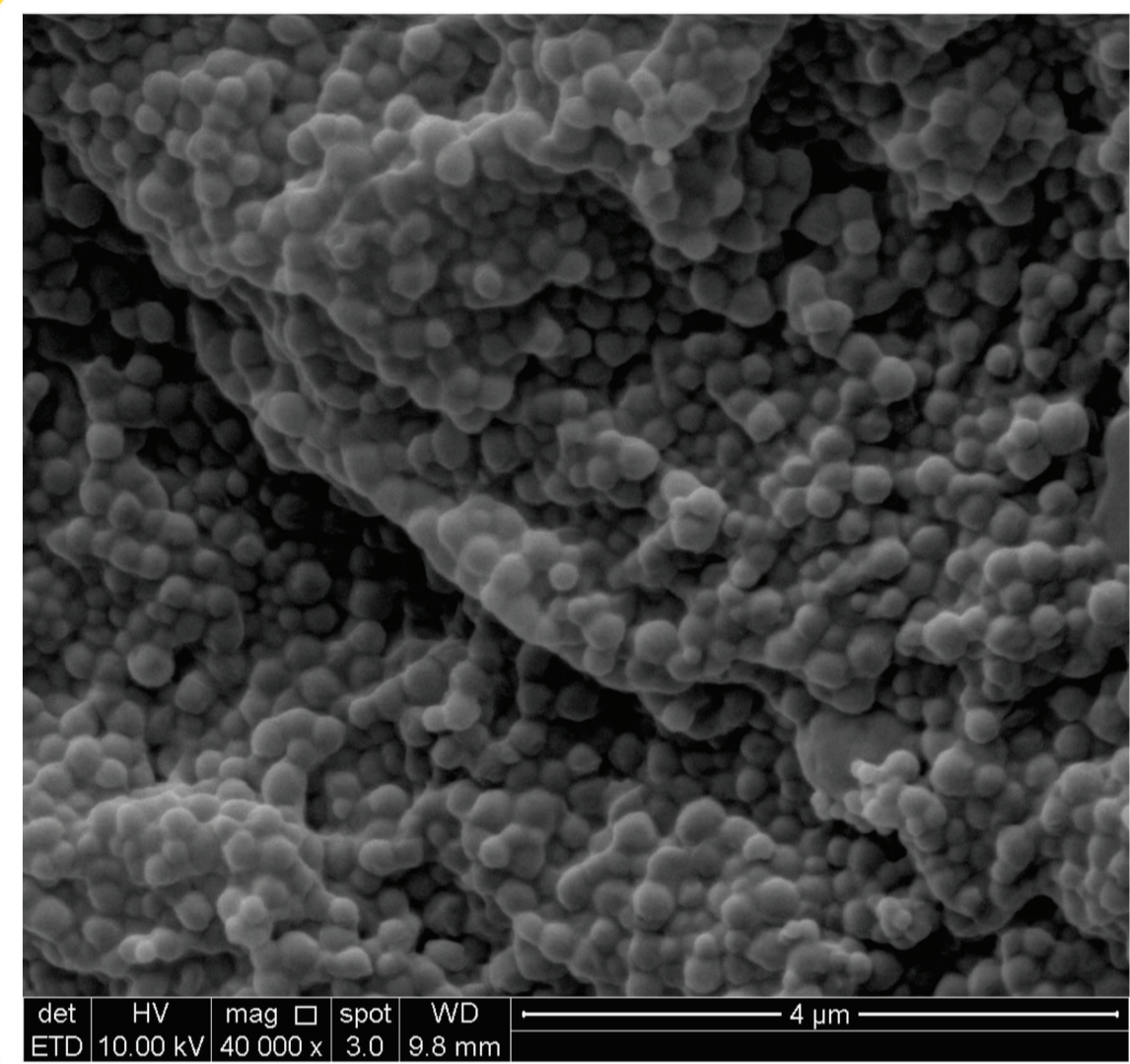
Researchers:

DR. LEE HOOI LING
Dr. Mohamad Nasir Mat Arip
Teng Teck Jin

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NANOBIOCIDE AS WOOD PRESERVATIVE FOR WOOD INTERIOR AND EXTERIOR APPLICATIONS

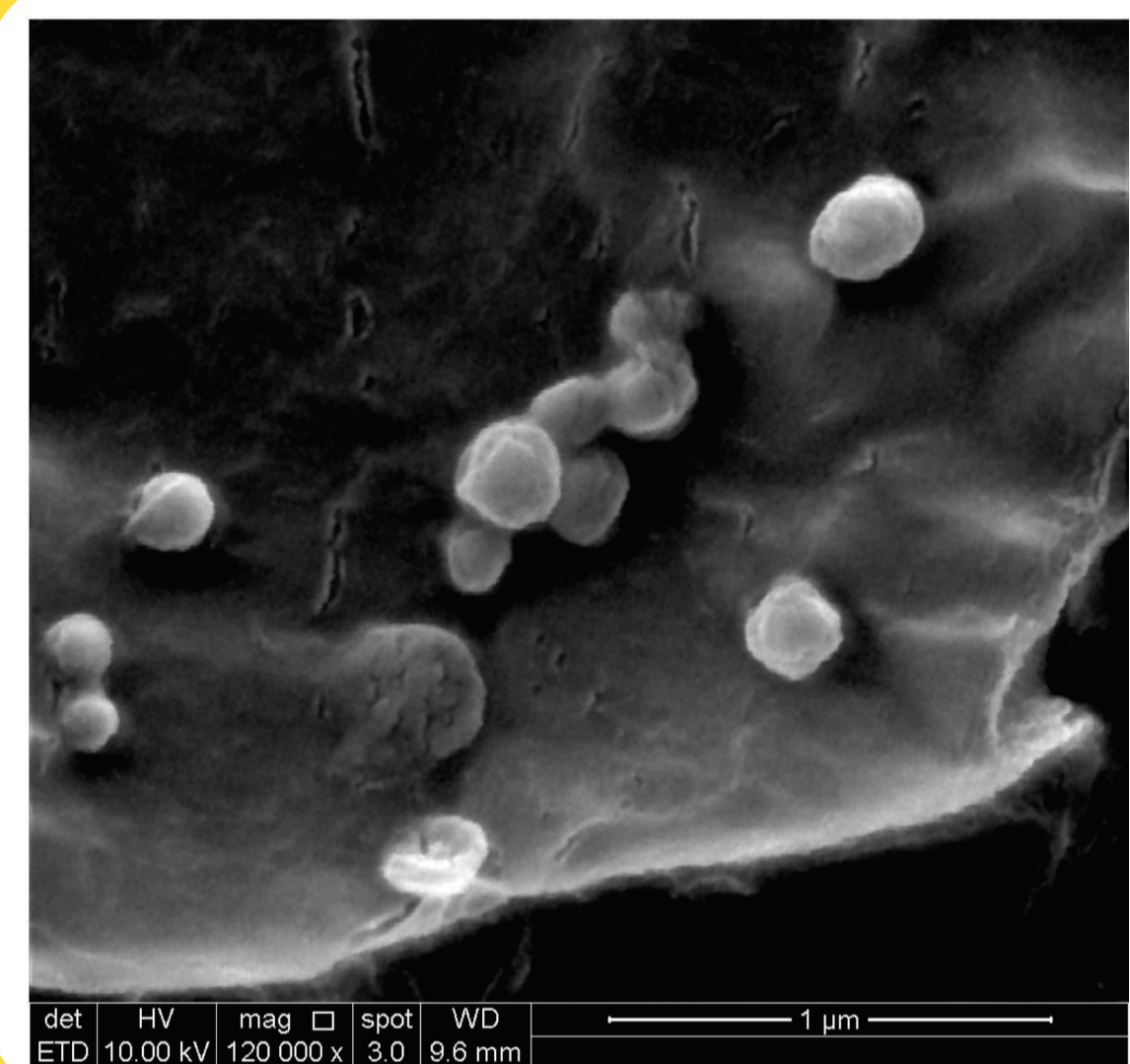


Problem Statements

- Chromated copper arsenic (CCA) is toxic - There is a need for alternative wood preservative to replace CCA
- Chlorothalonil (CTL) has poor water solubility (<0.81 mg/L).
- A challenge to be applied in the water- based vacuum preservative treatment

Novelty & Inventiveness

- To promote the use of organic biocide as an alternative to conventional toxic wood preservatives such as chromated copper arsenic
- Polylactic acid (PLA) nanoparticles act as carriers to deliver a hydrophobic organic biocide CTL into tropical wood
- Low production cost, excellent solubility in water, better penetration into wood structure, and provide comparable biological resistance to wood

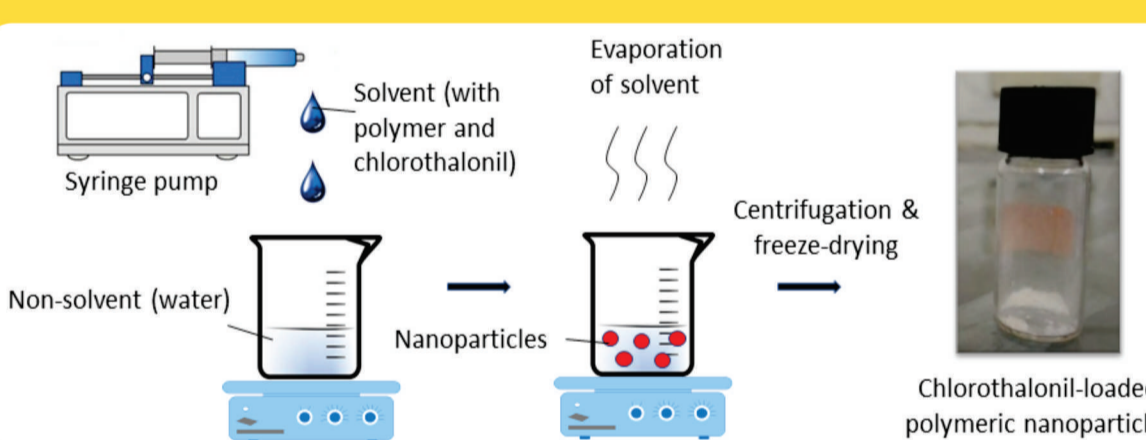


Applicability

- Apply treatment directly on wood structure before utilising it on interior (furniture) and exterior (decking) applications
- Suitable for water-based industrial preservative treatment
- Low production and treatment cost

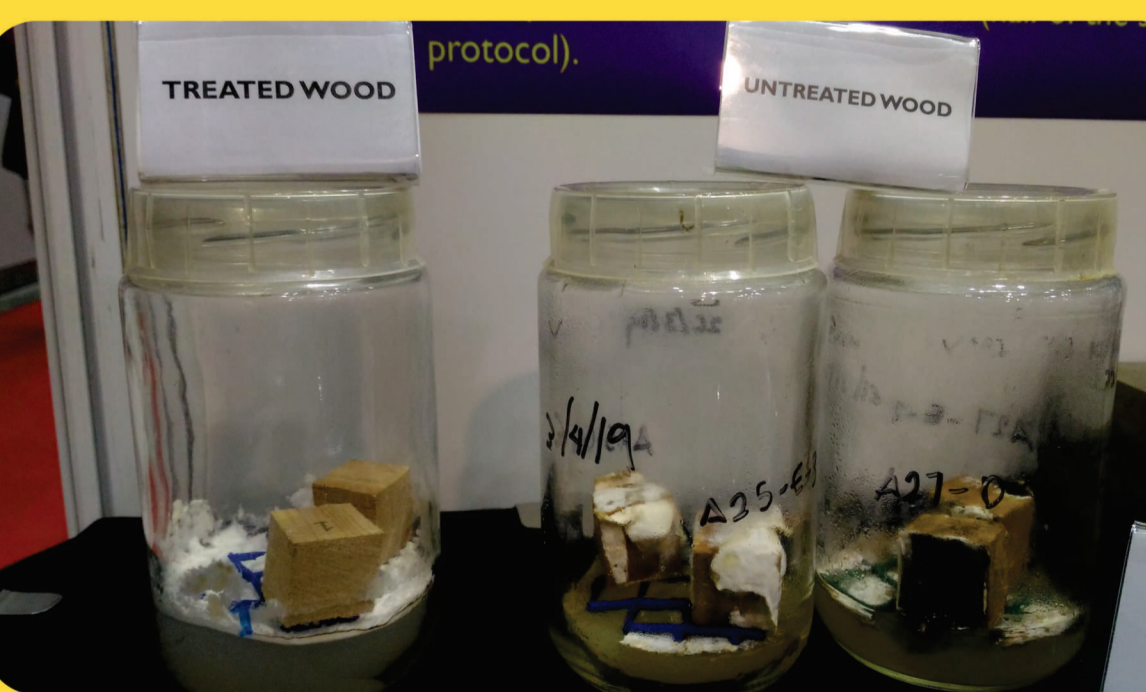
Product/Technology Readiness

- Technology Readiness Level 4
- CTL-loaded PLA nanoparticles - 128.6 ± 4.5 nm.
- Nanoparticles delivered into rubberwood via vacuum pressure treatment based on Malaysia Standard (MS360:2006)
- Treated wood showed high resistant towards wood destroying organism based on international standard (ASTM, EN and AWP)



Research Achievement

- Two publications (1 Q2 paper, 1 full paper proceeding)
- Silver Medal in ITEX 2019
- 2018 Ron Cockcroft International Award by International Research Group on Wood Protection – The only Asian out of 13 recipients
- Third prize in Pertandingan Projek Penyelidikan Nanoteknologi Peringkat Kebangsaan 2017
- Completed a MSc. student and an undergraduate student
- Fundamental Research Grant Scheme (203/PKimia/6711532)
- MoA with Forest Research Institute Malaysia (FRIM) since 2016



Intellectual property

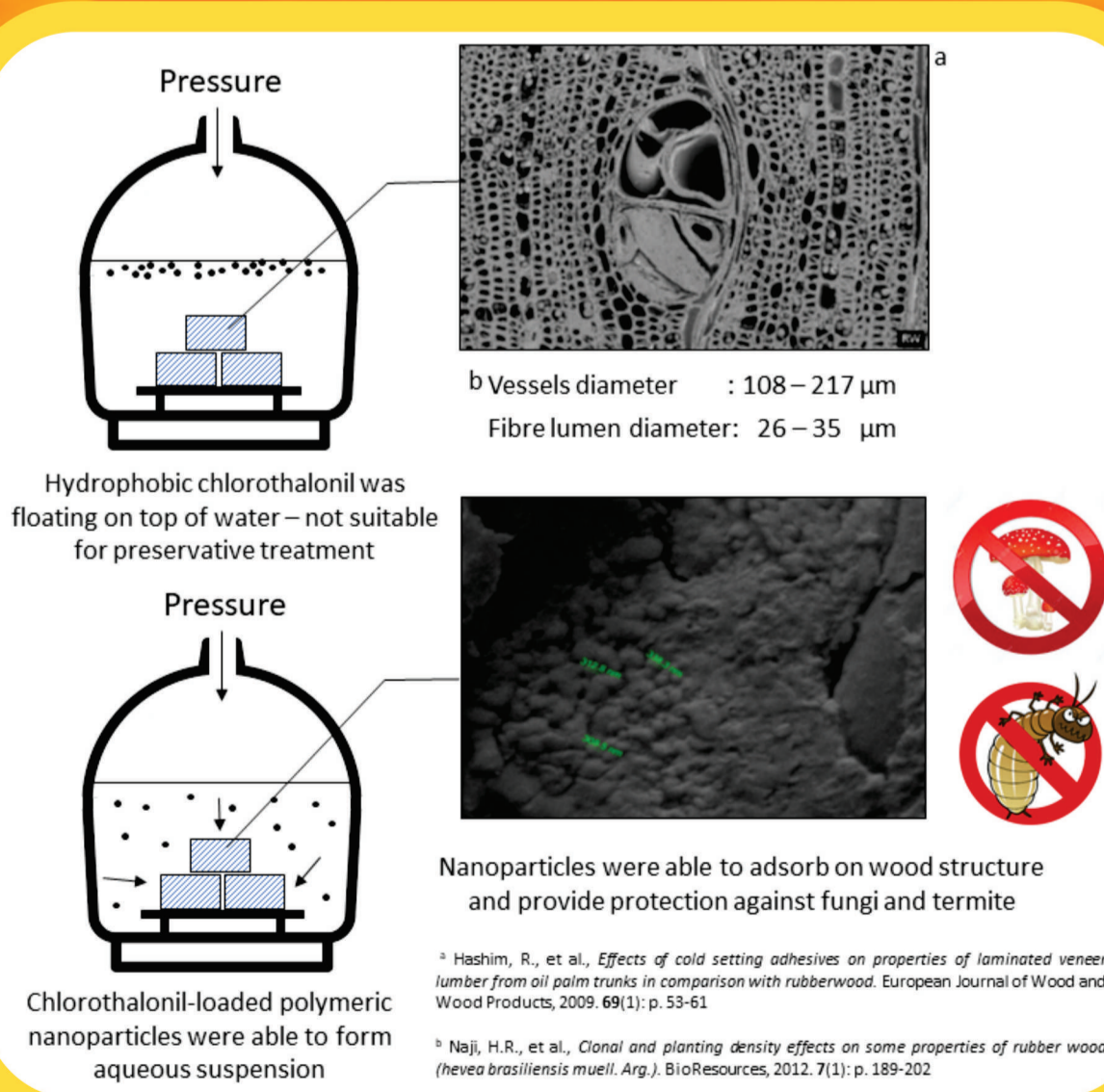
- Copyright (Application number: LY2018002244)

Commercialization Potential

- Pioneer in Southeast Asia
- Suitable for global wood market
- Letter of Intent from Tong Sim Wood Industries Sdn. Bhd.

Level of Impact

- Reduce cost of preservative treatment – reduce energy and time needed
- Reduce impact on environment - low dosage and fully biodegradable



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