

# BIOPOLYMER MATRIX FOR THERMAL RESISTANT MOULDING COMPOSITE

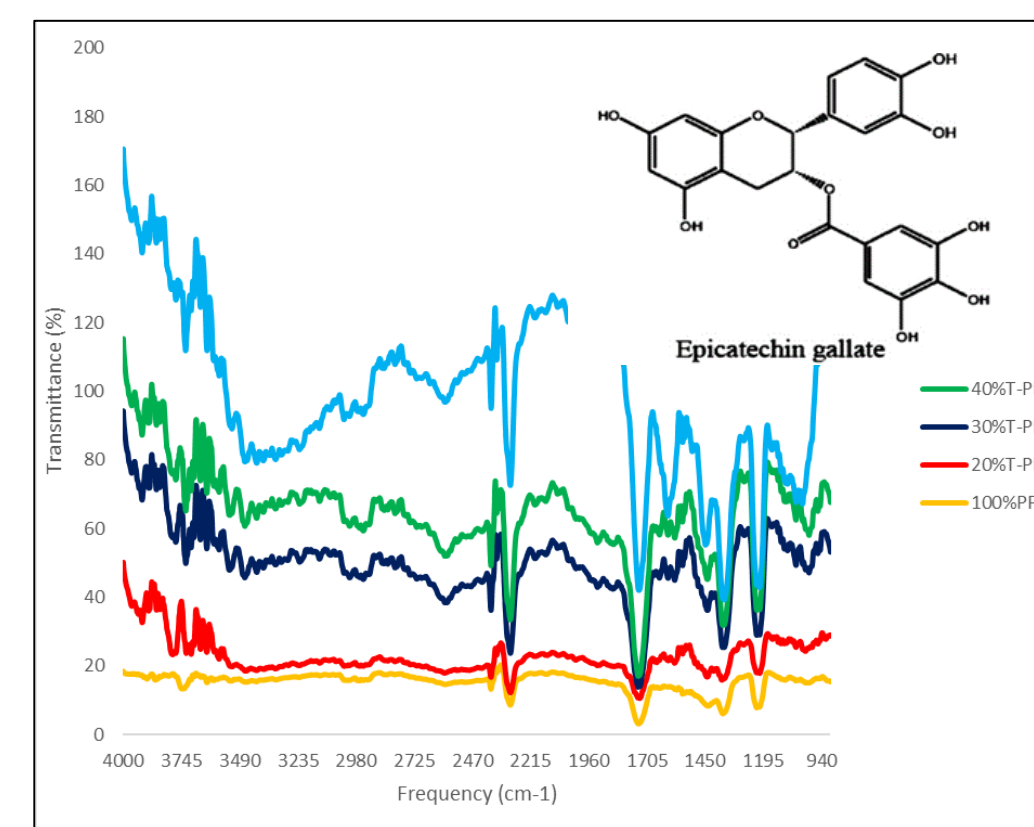
PI 2017702686

## INTRODUCTION OF TECHNOLOGY

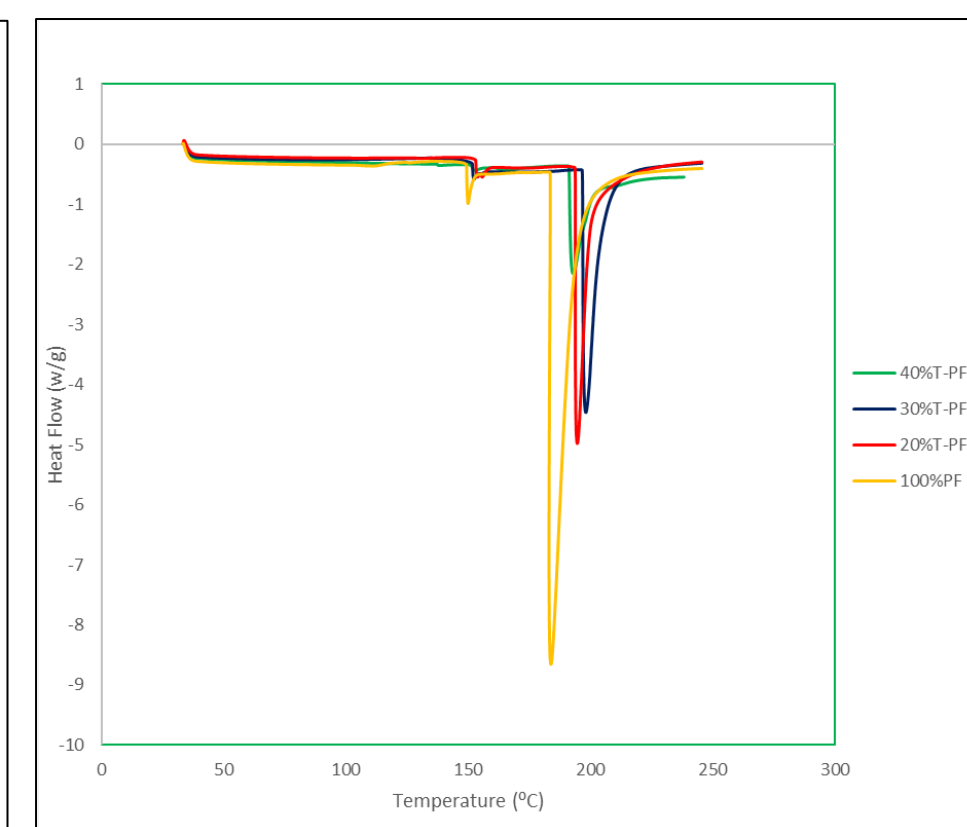
Tannin from the bark of *A.mangium* trees is one of the sources for producing biophenolic compounds. Petroleum-based phenolic resins are mainly used for interior composites because of their low smoke and flammability characteristics. Being polyphenolic in nature, it is envisaged that mangium tannin would behave the same.



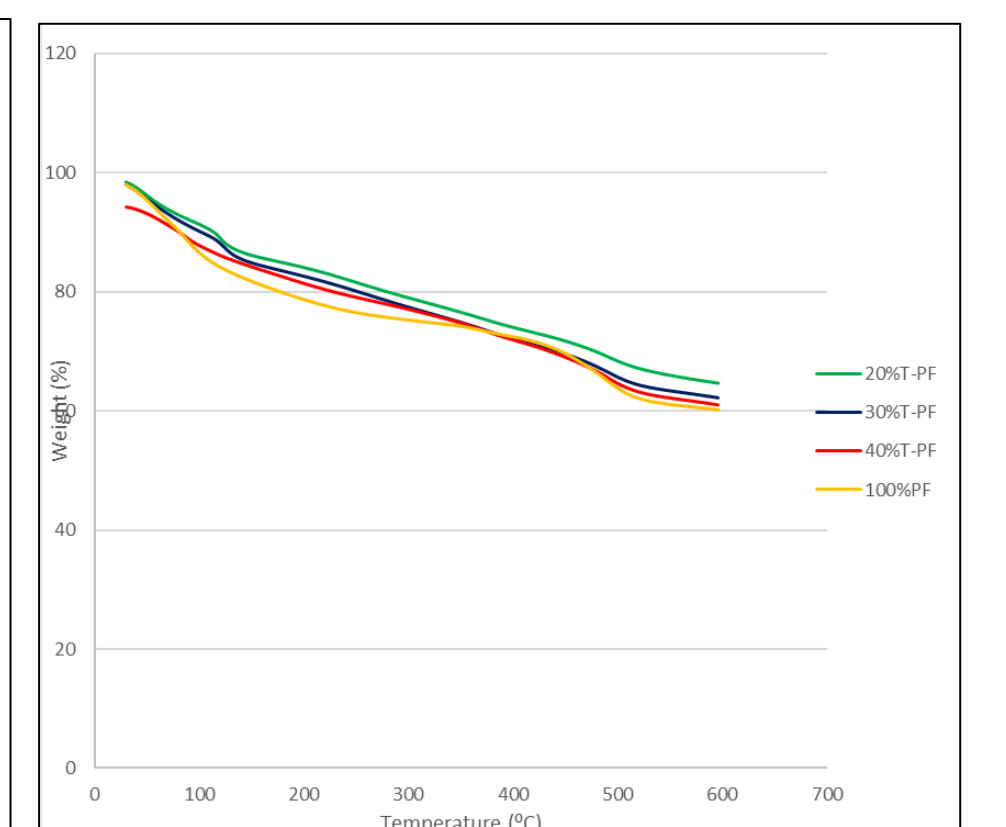
*Acacia mangium* barks collected from a chipmill in Pasir Gudang, Johore.



FTIR: Possible epicatechin gallate structure



DSC: TPF has higher melting point compared to PF



Mass loss occurs between 140-475°C due to degradation of the lateral chains of the resin



Cured commercial phenol formaldehyde (left) and mangium TPF (right).

Sample Type	Matrix	Flexural Strength (MPa)	Flexural Modulus (MPa)
GF+Kenaf Mat (1000 tex)	PF	24.15	1725
GF+Kenaf Mat (1000 tex)	TPF*	30.45	2078
GF+Kenaf Mat (1500 tex)	TPF*	9.56	282
GF+Kenaf Mat (2000 tex)	TPF*	4.77	222
TPF	TPF*	23.28	2210

## INVENTION

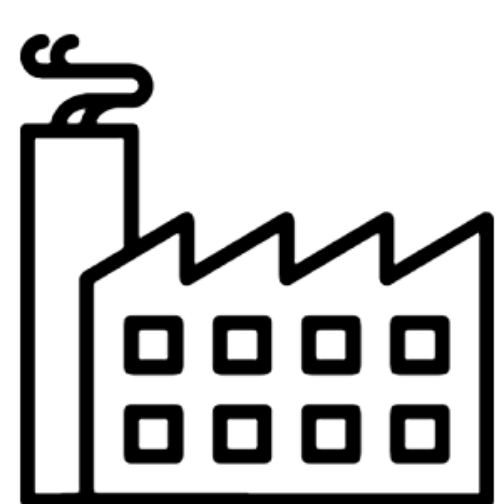
This invention relates to matrix development for moulding composites and specifically relate to methods for producing biopolymer matrix using *Acacia mangium* tannin phenol formaldehyde for thermal resistant moulding composite

The project is in collaboration with;



MAYAN ADHESIVES & CHEMICAL SDN. BHD.S

## MARKET POTENTIAL



Composite Industry



Vendors for automotive, aerospace, sports.



*Acacia mangium* processing mills

## ADVANTAGES

- ✓ Cured TPF has no pungent smell
- ✓ Cured TPF is very opaque and odourless
- ✓ TPF emits low formaldehyde emission
- ✓ TPF has comparable thermal properties with petroleum-based PF



Prof Dr. Paridah Md. Tahir  
Institute of Tropical Forestry and Forest Products / Faculty of Forestry  
parida@upm.edu.my  
03-89471880  
Wood and Natural Fibre Adhesion, Surface Coating, Bio.composite

www.sciencepark.upm.edu.my

For licensing information, contact [promosi@upm.edu.my](mailto:promosi@upm.edu.my) / 03-97692187

AGRICULTURE • INNOVATION • LIFE

BERILMU BERBAKTI  
WITH KNOWLEDGE WE SERVE I