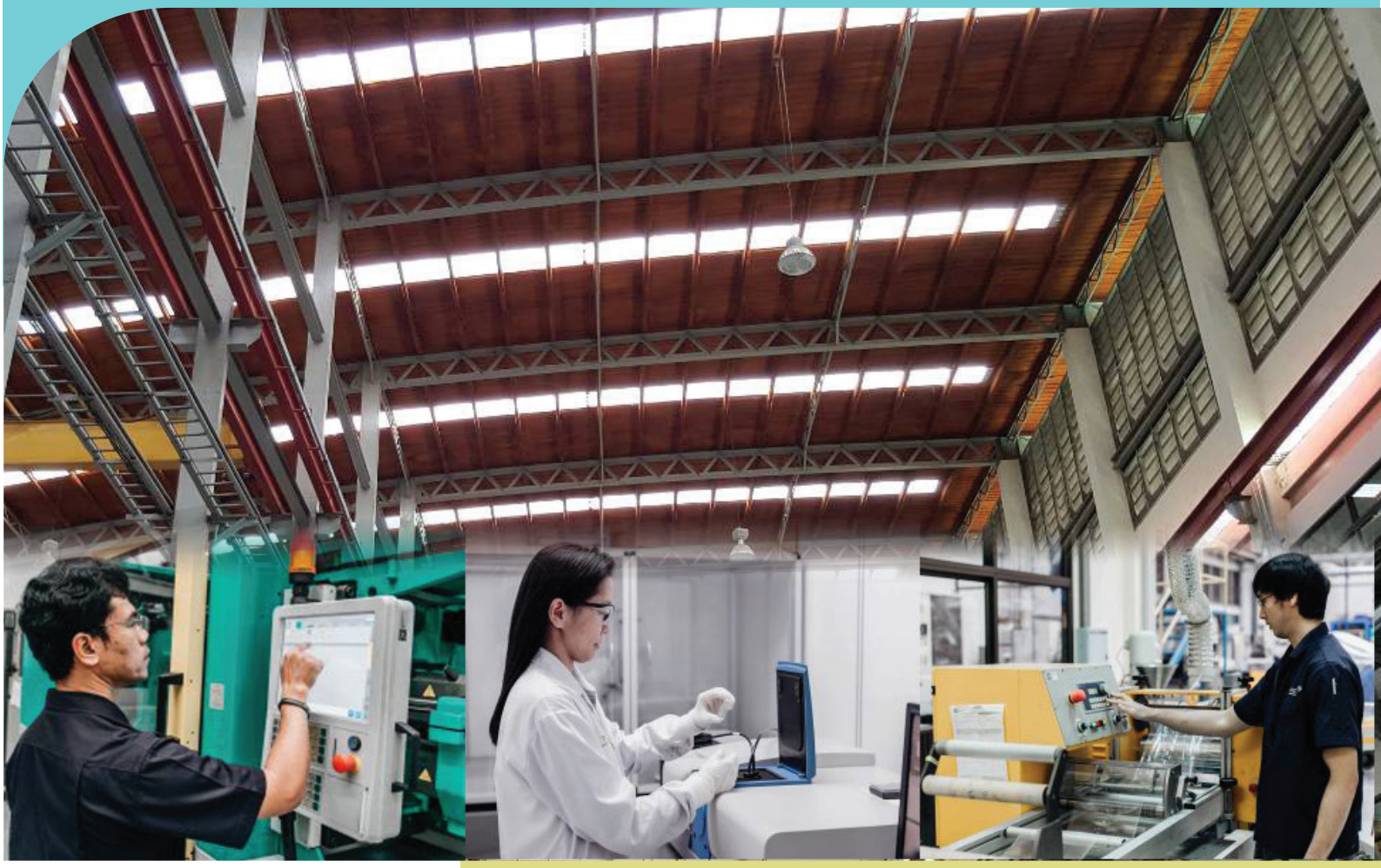
Advanced Polymer Technology Research Group

National Metal and Materials Technology Center



MTEC
a member of NSTDA

Research Team

- Plastics Technology Research Team
- Polymer Chemistry Research Team
- Food Materials Research Team
- Textiles Research Team
- Polymer Physics Research Team

Mission

Our mission is to enhance technology adoptions & innovations of Thai polymer-related industries, especially plastics, textiles and agro- & food industries through application-oriented research activities. The activities include in-house & contract research works, technical services, consultancy, technology transfers and strategic collaborations.

Current Research

Our research works aim to achieve necessary fundamental knowledge, technology and commercial prototypes for the Thai industrial sectors. Agriculture and food are of our current interests. We also carried out in-house research to establish knowledge and continually develop R&D staff skills. Our current research focuses are synthesis of functional polymers and organic materials; development of functional films, fibers and nonwoven and biodegradable plastic processing. Moreover, technology on natural dyes have been developed and transferred to local communities across the county and applications of rheology and extrusion technology in food structure design are now being extensively explored.

Director
Dr.Asira Fuongfuchat
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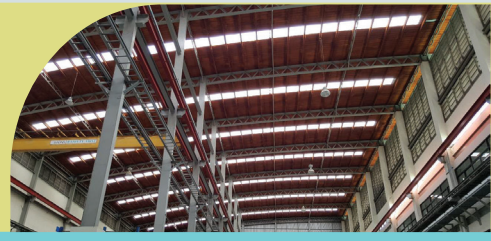


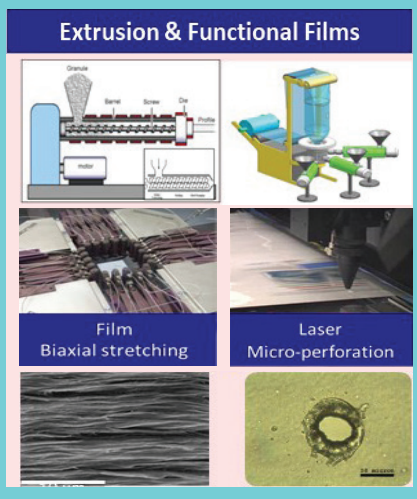
Plastics Technology Research Team : PLTT

Research Team Leader : Dr.Witchuda Daud

This Laboratory conducts research and development as well as providing technical services, using the skills and expertise of its staff coupled with appropriate application of modern instrumentation. Cutting edge equipment and fundamental analysis tools form the basis for building up the knowledge and understanding required to develop materials and processing technology to better suit the needs of the end users.

The capability and activities conducted in this Laboratory include: Compounding & Blending, Plastic film technology for packaging & specific applications, and Compostable films & packaging.

RESEARCH HIGHLIGHTS



Innovative and Sustainable Packaging for Thai Fresh Produce Industry: ActivePAK™, ActivePAK™ Ultra

Biodegradable Lidding Film

Polymer Chemistry Research Team : POCT

Research Team Leader : Dr.Doungporn Sirikittikul

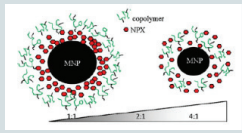
Polymer chemistry laboratory conducts research and development in chemistry of polymer synthesis, especially environmentally friendly polymers, from upstream to downstream. Our research works focus on plastic films for agricultural applications such as greenhouse films, nursery bags, and biodegradable fruit bagging film during growth, in order to increase the quality of the agricultural produces. In addition, our research and development also concentrate on the functionalized copolymers for using in food, medical and cosmetics applications.

Key Feature of Greenhouse Film

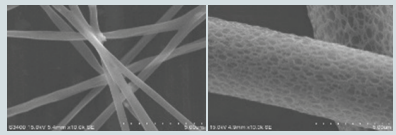
- UV Filter
- NIR Reflection
- Light Disfussion
- etc.

RESEARCH HIGHLIGHTS

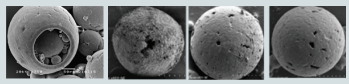
Bio-based materials



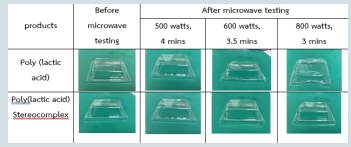
Copolymers Coated
Magnetic Nanoparticles (NMP)



Bio-based Nanofiber



Hollow Microbeads



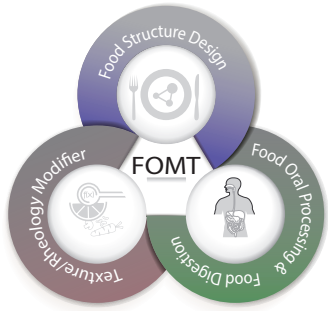
PLA Microwaveable Tray

Food Materials Research Team : FOMT

Research Team Leader : Dr.Nispa Seetapan

Our research revolves around three main themes as follows:

- Production of functional ingredients from agricultural wastes or products e.g. pectin, mucilage and plant proteins.
- Texture modification of healthy foods and personalized diets and food structure design through the application of material science and engineering knowledge.
- Investigation of food structure-property relationship during eating process including chewing and swallowing and digestion in the GI track (future plan).

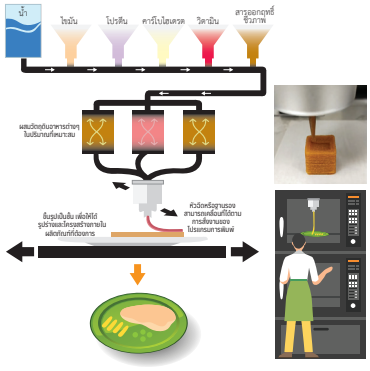


PLATFORM TECHNOLOGY

- Texture/Rheology Modifier
- Food Structure Design
- Food Oral Processing
- Food Digestion and absorption

RESEARCH HIGHLIGHTS

Easy-to-chew steak

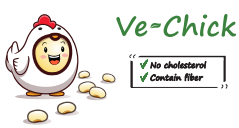


3D Food Printing

M-Pro Jelly Drink

Plant-based chicken

Ve-Chick



Plant-based Protein

Fork Tester
& Flow Tester

Gluten Free

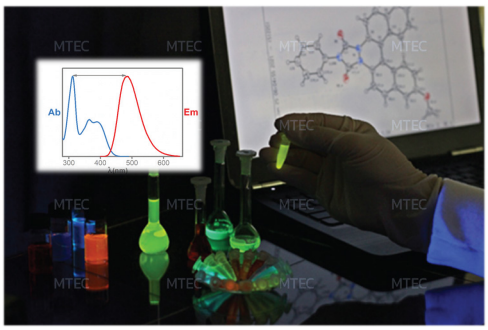
Polymer Physics Research Team : POPT

Research Team Leader : Dr.Thanasat Sooksimuang

The team is an interdisciplinary research group which emphasizes on fundamental studies and inventive technologies in material design, synthesis, characterization, and fabrication in a variety of forms including small molecules, polymers, particles, and thin films. Fluorescent organic compounds and fluorescent magnetic particle are the focused materials developed for biosensor, chemical diagnostics, and markers.

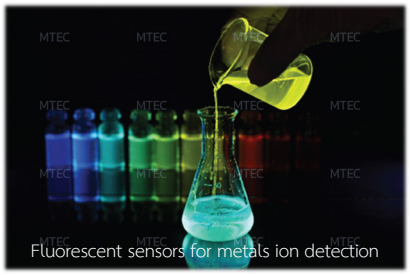
PLATFORM TECHNOLOGY

- Organic Compounds Molecular Design and Preparation
- Optical Properties Characterization
- Thin Film Fabrication



RESEARCH HIGHLIGHTS


Fluorescent organic probes for biosensing


Fluorescent sensors for metals ion detection

Textiles Research Team : TETT

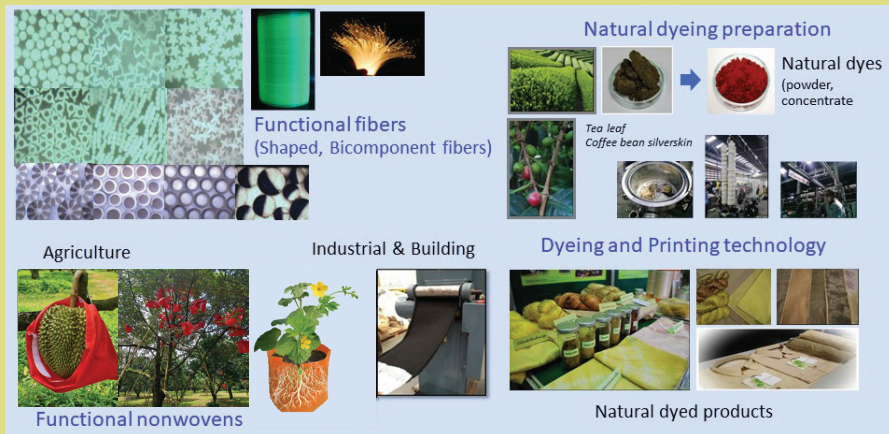
Research Team Leader: Dr.Chureerat Prahsarn

This laboratory conducts research and development on textile materials and technology. The research activities focus on three main areas: 1. Fiber Technology: Fiber structural design and spinning for special features and functions (New polymers/new additives, Shaped fibers, Bicomponent fibers, Bio-based fibers) 2. Nonwoven Technology: Structural design and fabrication for specific applications (Agriculture, Lightweight materials, Health &Hygiene) 3. Natural dyes Technology: Dye preparations (powder, concentrated) and applications (dyeing, printing), Eco-textiles

PLATFORM TECHNOLOGY

- Fiber structural design & processing
- Nonwoven design & fabrication
- Bicomponent fibers
- Natural dye preparation
- Natural dyeing and Printing

RESEARCH HIGHLIGHTS



Advanced Polymer Technology Research Group

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MTEC a member of NSTDA

เพิ่มประสิทธิภาพ การผลิต และคุณภาพ ของผัก ผลไม้

MultiTech พลาสติกคลุมโรงเรือน

MultiTech-Ultra

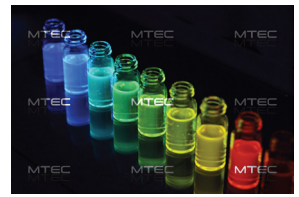
Magik Growth วัสดุสำหรับเพาะปลูก

Magik Growth วัสดุคลุมดิน

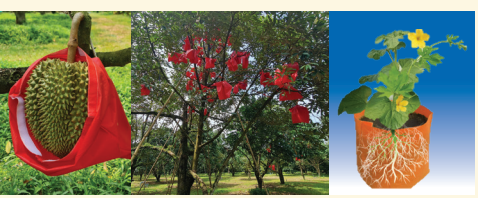
ActivePAK Technology by NSTDA บรรจุภัณฑ์ยืดอายุ ผัก ผลไม้

นวัตกรรมอาหาร เพื่อสุขภาพ และเฉพาะกลุ่ม

Organic Materials for Markers & Sensors



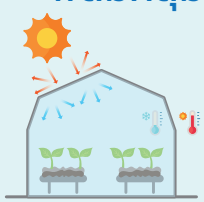
Magik Growth



- ควบคุมคุณภาพ
- ลดการสูญเสียระหว่างปลูก
- ลดค่าใช้จ่าย สารเคมี ปุ๋ย ยาค่าแมลง

MultiTech MultiTech-Ultra

ฟิล์มคลุมโรงเรือน



- ผลผลิตคุณภาพดี
- ดูแลง่าย

ActivePAK Technology by NSTDA

ถุงบรรจุภัณฑ์ ActivePAK™

- ลดการสูญเสียระหว่างขนส่งและวางจำหน่าย
- ได้บริโภคผักผลไม้ที่สด และยังคงคุณค่าสารอาหาร
- สามารถนำถุงกลับมาใช้ซ้ำได้

ฟิล์มปิดหน้าถาด ย่อยสลายได้

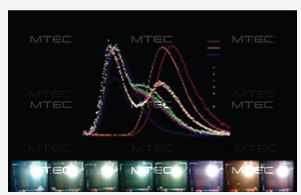
- เป็นมิตรต่อสิ่งแวดล้อม
- ฟิล์มมีความใสตลอดการใช้งานและวางจำหน่าย
- อาหารที่บริโภคมีความปลอดภัยจากการปนเปื้อน

Plant-based Chicken

- ผลิตภัณฑ์ทดแทนเนื้อไก่จากโปรตีนพืช
- เนื้อสัมผัสคล้ายคลึงกับเนื้อไก่ ปรุงเป็นอาหารต่างๆ ได้ทันทีไม่ต้องแช่แข็ง
- ปราศจากคอเลสเตอรอล มีเส้นใยอาหาร

Easy-to-Chew

- ออกแบบโครงสร้างและตัวปรับเนื้อสัมผัสให้มีเนื้อสัมผัสคล้ายเนื้อชิ้น
- นุ่มและบดเคี้ยวได้ง่าย
- ช่วยลดปัญหาในการบริโภคของผู้สูงอายุ หรือคนที่มีปัญหาในการบดเคี้ยว



White OLED

[5] helicene derivatives