

# Oleochemistry Recent research in Oleochemistry

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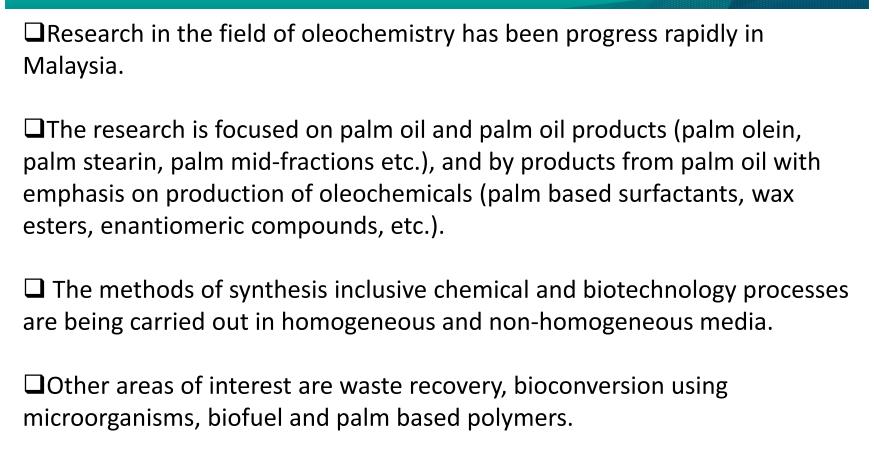


#### The student should be able to articulate:

- ☐ The advanced research in oleochemistry
- ☐ The new applications of oleochemicals



#### Recent research in Malaysia





### Plant oils: The perfect renewable resource for polymer science?

- Already for a long time, plant oils and their derivatives have been used by polymer chemists due to their renewable nature, world wide availability, relatively low price, and their rich application possibilities.
- Although many different synthetic approaches have been used, more recent examples are pointing in the direction of catalytic transformations and other efficient reactions to achieve a more sustainable production of polymers from these renewable resources.



### Polymers and surfactants on the basis of renewable resources

- A new strategy for the preparation of different polymers and special surfactants was developed.
- First, unsaturated fatty acid methyl esters obtained from plant oils were converted to terminally unsaturated esters by metathesis with ethylene using heterogeneous rhenium or homogeneous ruthenium catalysts.
- ☐ These esters were directly copolymerized with ethylene by an insertiontype palladium-catalyzed polymerization to functionalized poly-ol.



## Industrial development of heterogeneous hydrogenation catalysts

☐ It is shown that recent developments in industrial catalyst preparation are interwoven with the invention of fats and oils hydrogenation in the early 20th century and developments in catalyst characterization.



#### **BIOFUEL**

- ☐ The replacement of fossil fuels by renewable sources of energy can give rise to significant alterations in the resource profile of a country, but may also create far-reaching environmental, economic and social issues.
- ☐ Biodiesel, produced by the catalytic transesterification of vegetable oils and short-chain alcohols, is one of the most important alternative fuels currently available for use in internal combustion engines.



### Biodiesel production by ethanolysis of mixed castor and soybean oils

Biodiesel was produced by ethanolysis of pure castor and soybean oils, and mixtures thereof, using potassium hydroxide as catalyst.
 The yields and selectivities of these reactions were evaluated.
 The results revealed that there was no appreciable substrate preference when the vegetable oils were transesterified in admixture.
 However, higher reaction yields and increased efficiencies of the purification process were directly correlated with the

proportion of soybean oil present in the reaction mixture.



#### Conclusion

☐ The research in oleochemistry evolves thus the new oleochemicals have been applied in various applications.





### Chapter description

All pictures/photographs/diagrams/figures used in this chapter is subjected to common creative that for education purposes

