

Oleochemistry

Recent research in Oleochemistry

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<http://ocw.ump.edu.my/course/view.php?id=68>

The student should be able to articulate:

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



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Recent research in Malaysia

- ❑ Research in the field of oleochemistry has been progress rapidly in Malaysia.
- ❑ The research is focused on palm oil and palm oil products (palm olein, palm stearin, palm mid-fractions etc.), and by products from palm oil with emphasis on production of oleochemicals (palm based surfactants, wax esters, enantiomeric compounds, etc.).
- ❑ The methods of synthesis inclusive chemical and biotechnology processes are being carried out in homogeneous and non-homogeneous media.
- ❑ Other areas of interest are waste recovery, bioconversion using microorganisms, biofuel and palm based polymers.



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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.



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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 insertion-type palladium-catalyzed polymerization to functionalized poly-ol.



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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.



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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.



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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.



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Conclusion

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



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Chapter description

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



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