

Subject Planning for Semester 16171/IJA (SEMESTER 1 SESSION 2016/2017)

Subject	OLEOCHEMISTRY
Subject Code	BSK3523
Credit Hours	3
Faculty	FAKULTI SAINS & TEKNOLOGI INDUSTRI
Passing Mark	40

Prerequisite

Equivalency

Synopsis

This course covers various aspects of oils and fats, including oleochemical derivatives. Oleochemical compounds are environmentally friendly chemicals that can be produced from raw material of oils and fats from plant, animal and petroleum by cracking process, or modification. In recent times, with depleting oils from fossil origin, oils and fats of non-fossil origin have started to make great re-entries into various industries including the fuel sector. The advantage of such oils and fats is that their sources are renewable. Research in the field of Oleochemistry has been progress rapidly in Malaysia. This allows our country to continue to emerge as a developed country that is competitive and continues to lead the global oleochemical industry. In this course, recent trends in research and development of Oleochemistry will be discussed.

Objective

- 1 Understand the general concept of oleochemistry (lipids, triacylglycerols, fatty acids ect)
- 2 Studied the oleochemical feedstocks, production, analyses, biocatalyst, structures and applications
- 3 Appreciating the application of oleochemistry
- 4 Updating the research in the field of Oleochemistry.

Contact Hour

References

- 1 Kasheela Devi, Hazimah, Surina, Tan Yew Ai & Rosnah Introductory Course On Oleochemistry MPOB
- 3 Frank D. Gunstone and Richard J. Hamilton Oleochemical manufacture and applications Sheffield : She
- 5 Tham, San Chin Reaction kinetics of the catalytic esterification of oleic acid with methanol UMP
- 6 Gurmit Singh Oil palm and the environment : a Malaysian perspective Kuala Lumpur: Malaysian Oil Palm
- 7 Lau, Kah Choon Oil palm mesocarp fiber treated with imidacloprid to control termite attack UMP
- 8 Mohamad Izzuddin Yakari Oil Palm Frond (OPF) as an alternative source of pulp and paper production m
- 9 Ahmad Zulkhairi Muhamad Oil palm biomass conversion to bio-oil through direct fired pyrolysis process

Assessment Plan

QUIZES	10 %/Quiz
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Subject Planning

Week	Chapter	Topic
1	1	INTRODUCTION TO OLEOCHEMISTRY The Oleochemical industry Historical development Renewable resources Producers of oils and fats Oils used for industrial purposes Important cost factors for chemical industry
2	2	THE FUNDAMENTAL CONCEPTS OF OLEOCHEMISTRY Oleochemistry Background Feedstocks for oleochemistry Fats and Oils Triacylglycerol Fats and oil composition Fatty acids-Introduction
3	3	PALM OIL PROCESSING Crude Palm Oil (CPO) Palm oil refining Bleaching Neutralization Deodorisation Fractionation 1 Physical refining 2 Chemical refining
4	4	FATTY ACIDS Systematic and trivial names of fatty acids Classification Isomers in fatty acids Chemical structural formula and nomenclature for fatty acids
5	5	OLEOCHEMICAL DERIVATIVES Oleochemical reactions and their applications Oleochemical unit Fatty acids Methyl ester Glycerol Fatty alcohol
6	6	ANALYSES IN OLEOCHEMISTRY Acid Value Saponification Value Iodine Value Color/Moisture Unsaponifiable method insoluble impurities Heating and cooling profile Liquid Chromatography Iodin value Peroxide Value

Week	Chapter	Topic
		Acids composition analysis Lipid classification
7	7	Types of triglycerides Essential fatty acids Cholesterol, lechitin and lipoproteins Lipids and health Fat substitutes Rancidity
8	8	APPLICATION OF BIOTECHNOLOGY IN OLEOCHEMISTRY Enzymes Production of enzymes Lipase Selectivity Commercial lipase Reaction of lipase Application of lipase Products through biocatalyst Advantages and disadvantages of enzymes catalyst
9	9	INTRODUCTION TO SURFACE CHEMISTRY-COLLOIDS Application of colloids Classification of colloids Generally used methods to prepare colloidal systems Purification of colloidal solutions Properties of colloids
10	10	SURFACTANTS Surfactants classes Anionic surfactants Amphorteric surfactants
11	11	Cationic surfactants Nonionic surfactants Natural surfactants Current trends and limitations
12	12	BIOFUELS Definition and standards Transesterification Standard recipes Process issues
13	13	RECENT RESEARCH IN OLEOCHEMISTRY Renewable resources Food Polymers Biolubricant Biofuels