University of Lambung Mangkurat

Implementation of a new wetland material for the production of the additive triacetin using biodiesel by-products

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According :

Global biodiesel production is projected to increase to 50 billion L by 2030

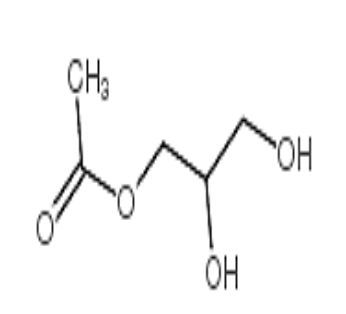
Biodiesel production will produce about 10% glycerol as the main by-product

ACETIN

obtained through the **esterification process** of the reaction of glycerol with acetic acid [1].

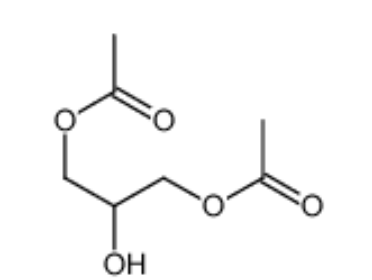
01.

Monoacetin
(monoacetyl glycerol)



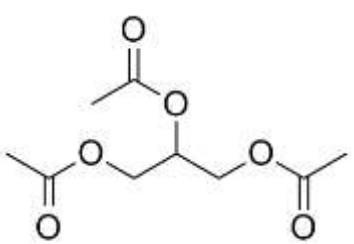
02.

Diacetin
(diacetyl glycerol)

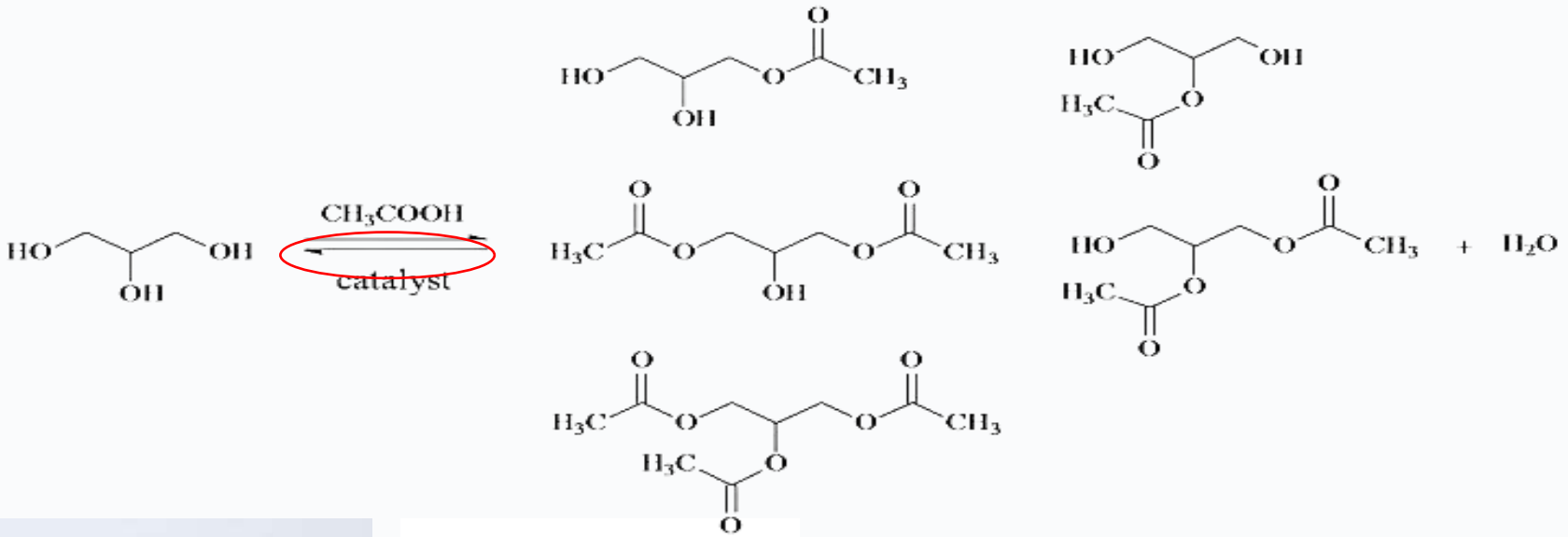


03.

Triacetin
(triacetyl glycerol)



TRIACETIN



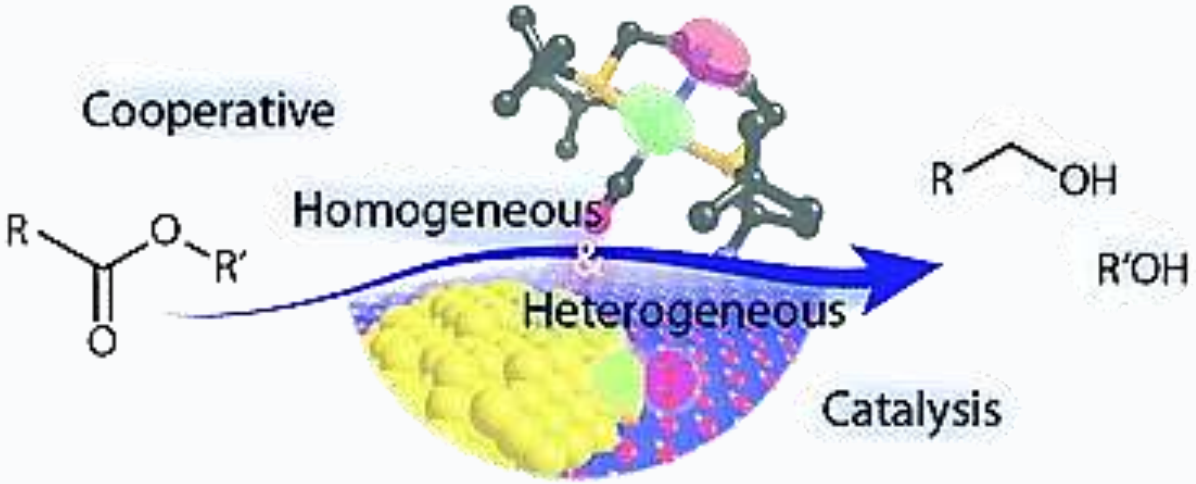
Benefits :

emulsifiers, plasticizers and additives such as octane boosters to reduce engine knocking, etc [2].

Heterogeneous Catalysts

Orange Peel

The natural potential that can be used as raw material for heterogeneous catalysts is agricultural biomass waste



Research Methods

01.

preparation of materials

02.

extraction and synthesis of catalysts

03.

purification of crude glycerol

04.

esterification process

The results of which were then carried out a GC-MS test to determine the selectivity of triacetin

Results of The Research

The extraction and synthesis of the catalyst

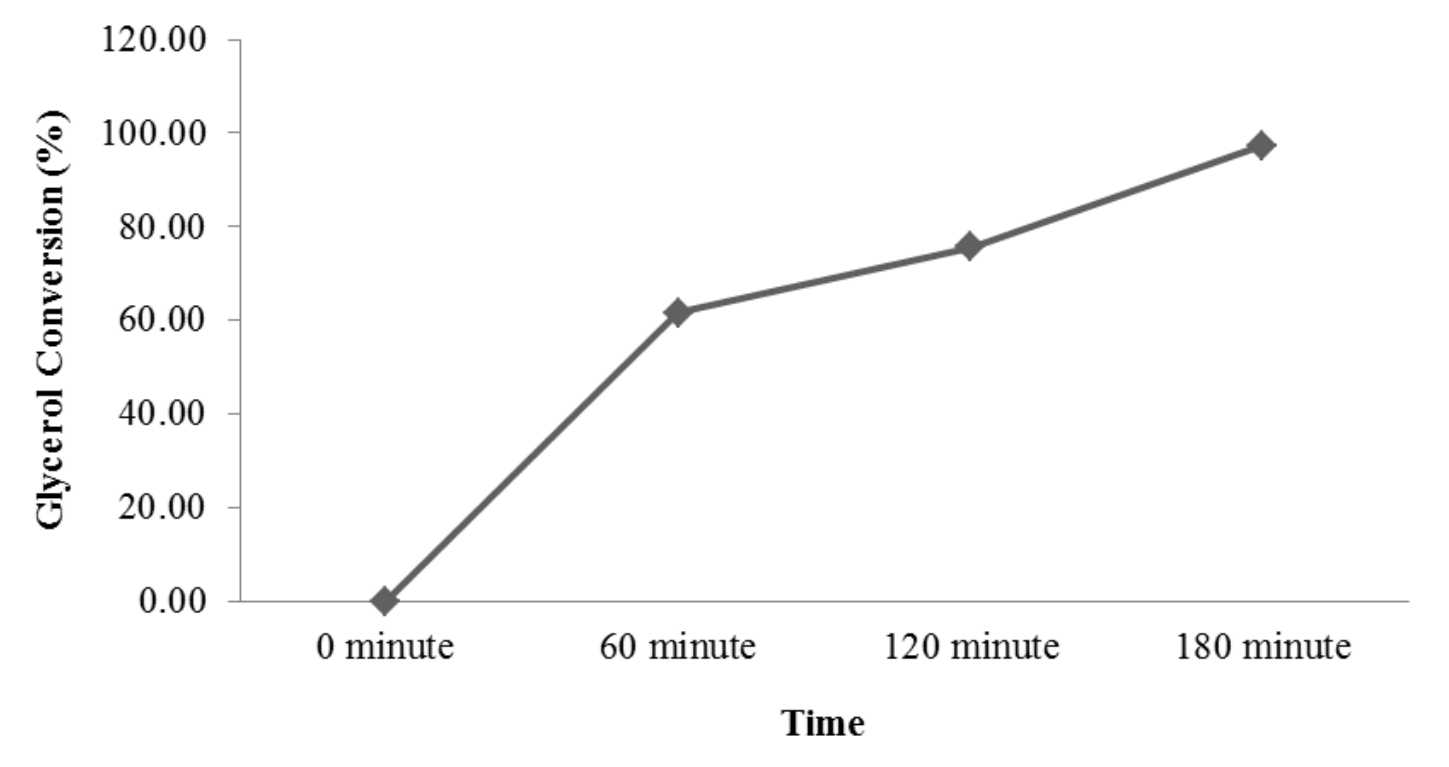
The percentage of silica yield of orange peel extract : 0.12 %

The purification of crude glycerol

The density value :

Crude Glycerol	1.224 gm^{-1}
Glycerol Purification	1.257 gm^{-1}

Results of The Research



Research treatment :

1. Reactant Rasio → gycerol : acetic acid (1:12)
2. Temperature → 115^{O}C
3. Stirring speed → 1000 rpm
4. Catalyst → 3% silica orange peel extract

The conversion of glycerol purified

0 minute	60 minute	120 minute	180 minute	Triacetin selectivity
0 %	61.69 %	75.58 %	97.41 %	100 %

CONCLUSION

The use of silica catalyst in the esterification reaction for the production of triacetin caused the highest glycerol conversion, namely 97.41% with a selectivity of triacetin of 100%.

Therefore, the production of triacetin using a silica catalyst derived from biomass, especially heterogeneous catalyst derived from orange peel can be recommended for use in the esterification process to obtain a high glycerol conversion value and triacetin selectivity

Acknowledgments

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Thanks !

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