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Research article

CATALYTIC PERFORMANCE OF ACTIVATED MGO IN THE GLYCEROLYSIS OF PALM KERNEL OIL FOR TAG CONVERSION

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Abstract

The use of heterogeneous catalysts in synthesizing mono- and diacylglycerols has increased significantly, with metal oxides favoured for their thermal stability, large surface area, and easy purification. Activation is crucial for enhancing their reactivity and optimizing catalytic performance. This study aimed to evaluate the effect of the catalyst activation method in the glycerolysis reaction. Mono- and diacylglycerol (MDAG) products were synthesized via glycerolysis of coconut oil. The process used glycerol as the substrate, with a molar ratio of 1:2.3 and 2% magnesium oxide (MgO) as a catalyst. The optimal product was achieved at a reaction temperature of 175°C using water-impregnated MgO. This resulted in a triacylglycerol (TAG) conversion of 68.73%, a monoacylglycerol (MAG) content of 4.81%, a diacylglycerol (DAG) content of 26.46%, a slip melting point range of 22.8–24.7°C, and a free fatty acid (FFA) level of 0.78%.