

Effect of temperature, pressure, and acidity of zirconia on catalytic cracking of methyl stearate via ketonic decarboxylation

Pawaphat Sartsri¹, Patcharaporn Weerachawanasak², Piyasan Praserttham¹

¹Chulalongkorn University, Thailand

²King Mongkut's Institute of Technology Ladkrabang, Thailand

The transformation of fatty acids and derivatives into fuels and other useful chemicals is growing interested in recent years. Ketonic decarboxylation is one of the most reactions to convert carboxylic acids or carboxylic esters into ketones, carbon dioxide, and water. Generally, the ketonic decarboxylation of fatty acids is carried out in the gas phase at high temperatures from 400 to 550°C at atmospheric pressure. However, the cracking reaction usually occurs as the side reaction that resulting to decrease the selectivity and restrict the yield of the desired ketone product. Methyl stearate (C 18:0) is one of the key Fatty Acid Methyl Ester (FAME) component of biodiesel fuel and it becomes more attention in Thailand as an alternative and renewable diesel fuel. Therefore, methyl stearate was selected as a substrate for ketonic decarboxylation. Moreover, various factors such as temperature, pressure, acidity, etc. were reported as the effects which promote catalytic cracking side reaction during ketonic decarboxylation. Therefore, this work is focused to investigate the optimum condition that suppressed the catalytic cracking of methyl stearate. The ketonic decarboxylation of methyl stearate has proceeded in a tubular fixed bed reactor containing commercial monoclinic zirconia (m-ZrO₂) catalyst. The effect of temperature, pressure, and acidity of zirconia will be investigated to optimize for minimizing the cracking ratio. The degree of factors

was considered in term of the relative cracking ratio which provides high conversion and high selectivity.

Biography: Miss Pawaphat Sartsri was born on December 14, 1994, in Thailand. She received a bachelor's degree in engineering (Chemical Engineering) from King Mongkut's Institute of Technology Ladkrabang in 2017. When she was an internship student, she got the great opportunity to intern relate to the petrochemicals industrial project innovation at Siam Cement Group (SCG) in Chemicals Business. Furthermore, she was especially interested in the field of catalysts and catalysis. So, she continued with her graduate studies in Chemical Engineering, Center of Excellence on Catalysis and Catalytic Reaction Engineering (CECC), Chulalongkorn University.

missiemudoi@gmail.com