

UNIVERSITI TEKNOLOGI MARA



SYNTHESIS AND CHARACTERISATION OF TiO BASED CATALYST FOR THE PRODUCTION OF FAME FROM THE ESTERIFICATION OF PFAD

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AUTHOR'S DECLARATION

I declare that the work in the thesis was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the results of my own, unless otherwise indicated or acknowledge as reference work.

I, hereby acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.

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SUPERVISOR'S CERTIFICATION

We declared that we read this thesis and in our point of view this thesis is qualified in terms of scope and quality for the purpose of awarding the Bachelor of Chemical Engineering (Environment) with Honours.

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ABSTRACT

TiO based catalyst mixed oxides solid catalysts were prepared and evaluated in the esterification of palm fatty acid distillate (PFAD) to produce fatty acid methyl ester (FAME). Esterification was conducted in a batch reactor at 100-170°C temperature ranges. The catalysts were characterized by several techniques such as BET and FTIR. The effect of catalyst preparation condition (catalyst ratio) and the influence of reaction conditions (methanol/PFAD ratio, temperature) were studied. The prepared catalyst with formula TiCr (calcined at 500°C for 2h) gave the maximum FAME conversion at best reaction conditions (160°C, 2h, 4:1 methanol/PFAD molar ratio, 1.5 wt% catalyst dosage). Thus, TiCr has shown promising potentials as heterogeneous catalyst for FAME synthesis from high acid value oils.