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Emulsions from mineral oil and medium chain triglyceride /  
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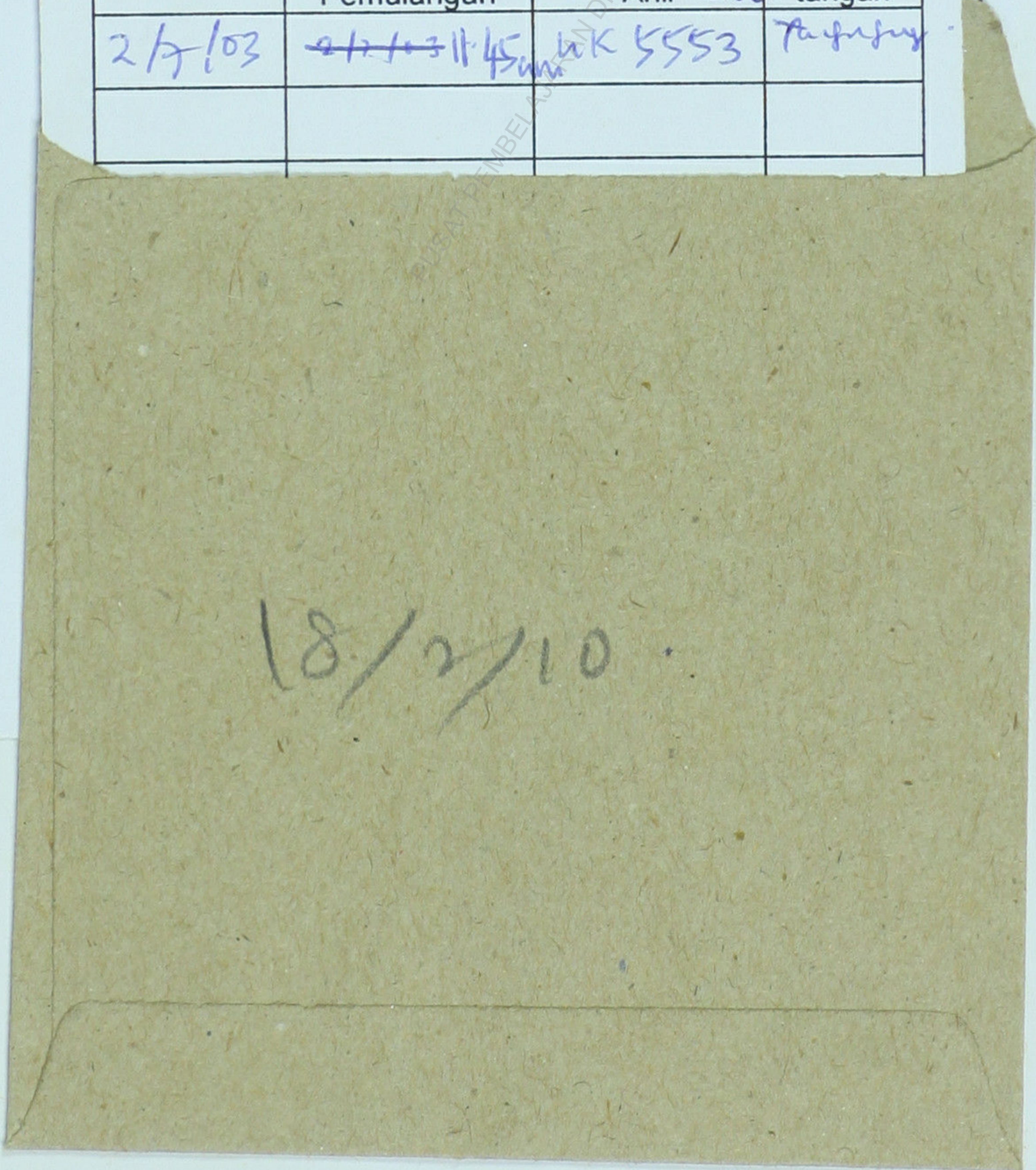
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EMULSIONS FROM MINERAL OIL AND MEDIUM CHAIN TRIGLYCERIDE

BY

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Thesis submitted in partial fulfillment of the requirement  
for the Degree of Bachelor of Science With Education (Hons) Chemistry.

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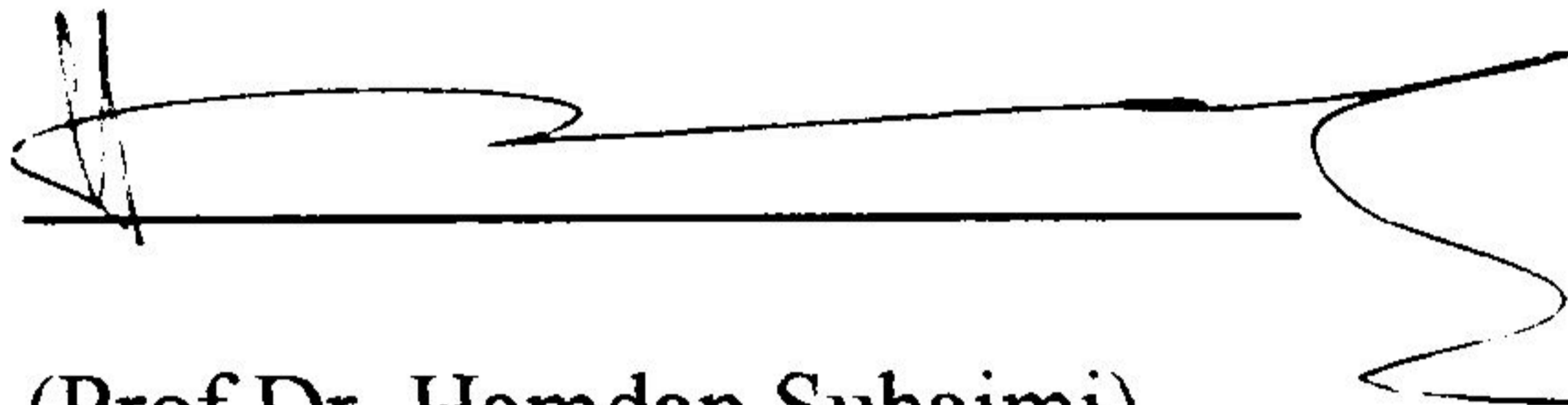
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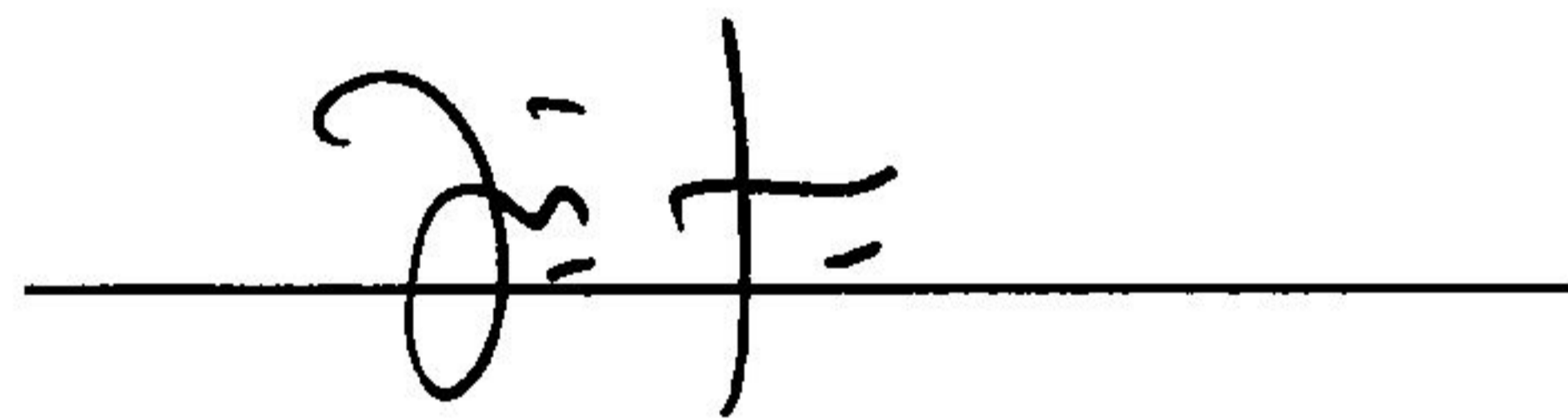
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For those whether they realized or not, will always be in happiness, enjoy themselves and blessed by the Almighty God, Insya Allah.

## ABSTRACT

Several phase diagrams were constructed to determine the region of emulsion that was formed. In this investigation, phase diagram of MO:MCT/ AOT was chosen because MO and MCT are soluble in each other. The phase inversion method was used in the formation of emulsions. The raw materials for the oil phase consisted of MO, MCT and AOT as surfactant, while the raw materials for the aqueous phase were distilled water and sodium borate. From the phase diagram study, it was observed when MO:MCT was taken at weight ratio of 50:50, the one phase region was larger compared to the equivalent system by using only MO and MCT.

Two combinations prepared the formulated emulsions, one with Petroleum Jelly and Carbopol ETD 2020 as thickening agent. Sixteen samples of emulsions were prepared using formulation of 90%, 60%, 40% and 5% (MO:MCT/ AOT). The ratio of oil phase and aqueous phase in formulation was 10:90 and 5:95. After the emulsification process, the emulsions were kept at 30°C. The emulsions stability was determined by measuring the percentage of volume in the separation phase between oil and water in the measuring cylinder. From the investigation, it was concluded that the emulsion with carbopol ETD 2020 as thickening agent were stable with small droplets size and close with each other except sample 9 (original formulation). While emulsion with Petroleum jelly (PJ) as thickening agent were unstable with large droplets size except sample 1 (original formulation) and sample 4.

## ABSTRAK

Gambarajah fasa dibina untuk menentukan kawasan emulsi yang akan terbentuk. Dalam kajian ini, gambarajah fasa MO:MCT/ AOT dipilih kerana MO dan MCT boleh melarut antara satu sama lain. Dalam pembentukan emulsi, kaedah pembalikan fasa digunakan. Bahan mentah untuk fasa minyak adalah MO, MCT dan AOT sebagai surfaktan. Manakala bahan mentah untuk fasa air adalah air suling dan natrium borat. Daripada kajian gambarajah fasa didapati, apabila MO:MCT diambil daripada nisbah 50:50 peratus berat, kawasan satu fasa adalah lebih luas berbanding dengan sistem yang sama dengan menggunakan hanya MO dan MCT sahaja.

Formulasi emulsi disediakan daripada dua kombinasi yang terdiri daripada agen pemekat dari petroleum jelly (PJ) dan Carbopol ETD 2020. Sebanyak 16 sampel disediakan dengan menggunakan formulasi 90%, 60%, 40% dan 5% (MO:MCT/ AOT). Nisbah fasa minyak dan fasa air dalam formulasi adalah 10:90 dan 5:95. Selepas proses pengemulsian, emulsi disimpan pada suhu 30°C. Kestabilan emulsi ditentukan dengan mengukur peratusan isipadu bagi fasa pemisahan minyak dan air dalam silinder penyukat. Hasil daripada kajian emulsi, didapati bahawa emulsi daripada pemekat Carbopol ETD 2020 adalah stabil dan mempunyai saiz titisan yang kecil dan rapat-rapat kecuali sampel 9 (formula asal) yang tidak stabil. Manakala emulsi daripada pemekat petroleum jeli adalah tidak stabil dan mempunyai saiz titisan yang besar dan jauh-jauh kecuali sampel 1 (formula asal) dan sampel 4.