

PRODUCTION OF EMULSIONS FROM  
COCOA BUTTER AND COCOA BUTTER SUBSTITUTE

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2001

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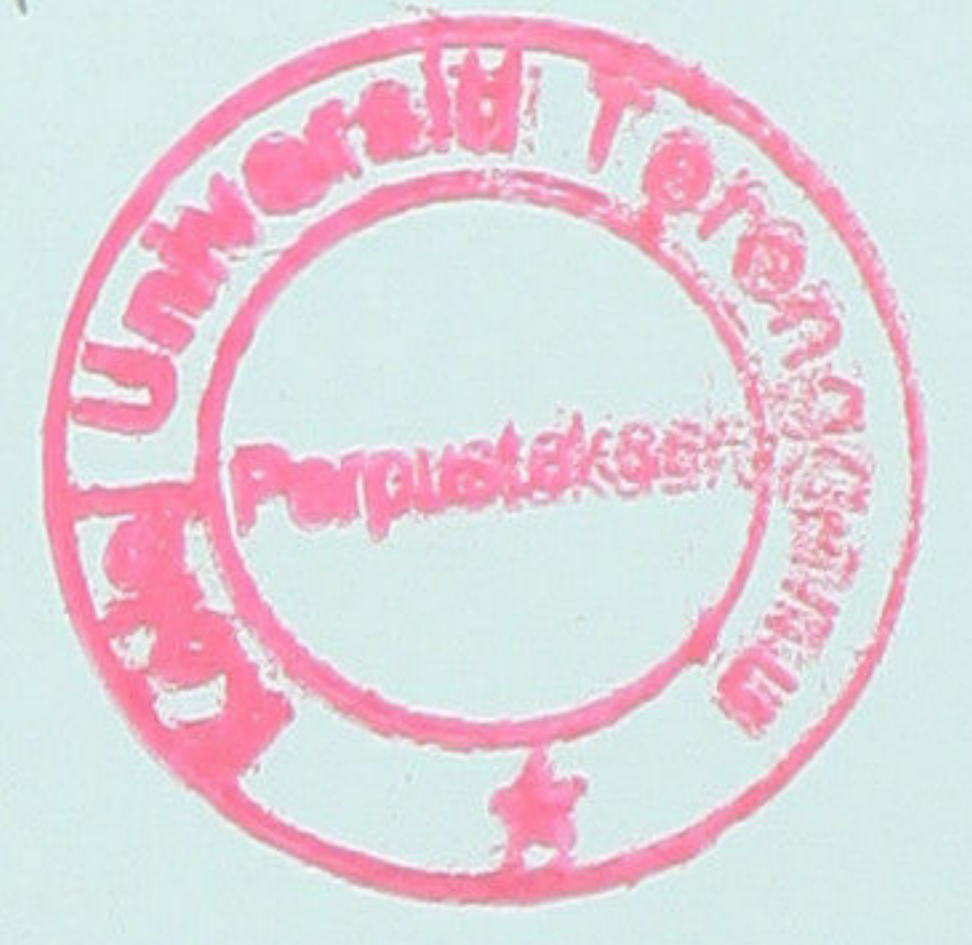
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Production of emulsion from cocoa butter and cocoa butter substitute / Tan Ai Ling.



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PRODUCTION OF EMULSIONS FROM  
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By

TAN AI LING

Thesis submitted in partial fulfillment of the  
requirement for the Degree of Science (Hons.)

FACULTY OF SCIENCE AND TECHNOLOGY  
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Approved By:

Supervisor




(Prof. Dr. Hamdan Suhaimi)

Date:

28/3/07

Coordinator

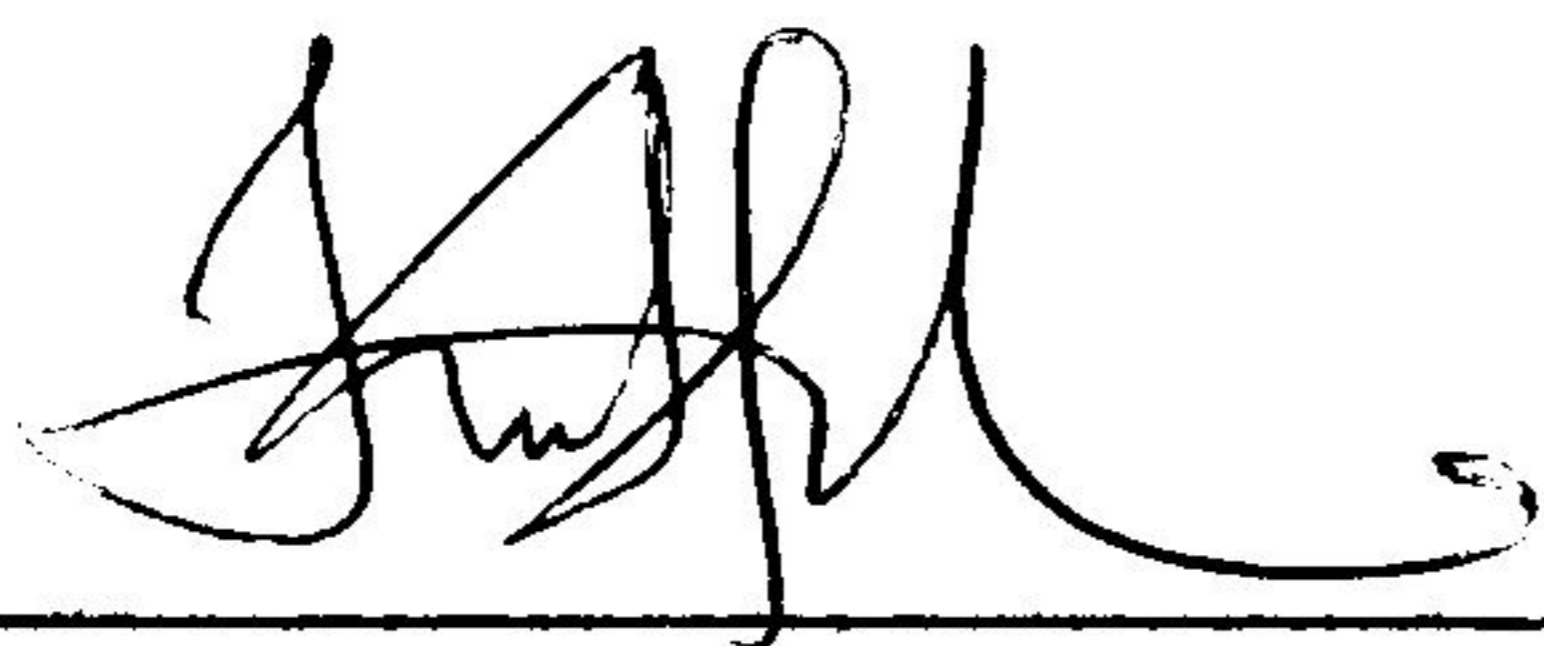


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Date:

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## ABSTRAK

Nilai HLB oleh pengemulsi boleh digunakan untuk menentukan jenis emulsi yang akan terbentuk. Dalam pemilihan pengemulsi, tiga gambarajah fasa yang terdiri daripada Brij 30/ Brij 58/ H<sub>2</sub>O, Brij 30/ Tween 80/ H<sub>2</sub>O telah dibina. Dalam pemilihan nisbah pencampuran pengemulsi yang terbaik, tiga lagi gambarajah fasa yang terdiri daripada pelarut: H<sub>2</sub>O, GLY dan H<sub>2</sub>O:GLY(10:1) telah dibina. Gambarajah fasa yang telah dibina daripada pelarut tetap/ MCT, 100% CB, 100% HPKO, CB:HPKO (3:7) dan CB:HPKO (5:5) dengan pencampuran pengemulsi Span 20:Tween 80 dalam nisbah berat (1:9) digunakan untuk menentukan kawasan emulsi yang akan terbentuk. Pelarut tetap yang sama seperti pelarut diatas digunakan. Dalam pembentukan emulsi, kaedah pembalikan fasa digunakan. Bahan mentah untuk fasa minyak adalah terdiri daripada air suling, gliserol dan Tween 80. Formulasi emulsi disediakan daripada dua kombinasi yang terdiri daripada kombinasi dengan MCT dan tiada MCT. Selanjutnya kedua-dua kombinasi disediakan dalam empat siri yang terdiri daripada 100% CB, 100% HPKO, CB:HPKO dalam nisbah berat 3:7 dan 5:5. Tambahan lagi, Carbopol ETD 2020 digunakan sebagai agen pemekat dalam formulasi. Nisbah fasa minyak dengan air dalam formulasi adalah 2:8. Selepas proses pengemulsian, emulsi disimpan pada suhu 30°C. Kestabilan emulsi ditentukan dengan mengukur peratusan isipadu bagi fasa pemisahan minyak/ air dalam silinder penyukat. Mikroskop berpolar merupakan alat yang baik untuk menentukan sifat hablur cecair. Mikroskop optikal pula digunakan untuk menentukan sifat emulsi. Akhirnya, sifat reologi bagi emulsi sampel diukur menggunakan pengukur

kelikatan Brookfield model 107 dengan pengawalan suhu berprogram Brookfield. Untuk keputusan terbaik, formulasi dengan MCT membentuk emulsi yang lebih baik.

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## ABSTRACT

The values as HLB by emulsifiers could be used to determine the type of emulsions formed. In the selection of emulsifier, three phase diagrams, which consisted of Brij 30/Brij 58/H<sub>2</sub>O, Brij 30/Tween 80/H<sub>2</sub>O and Span 20/Tween 80/H<sub>2</sub>O were constructed. In selecting the best mixed emulsifier ratio, another three phase diagrams which consisted of three solvents; H<sub>2</sub>O, GLY and H<sub>2</sub>O:GLY(10:1) were constructed. Phase diagrams constructed from fixed solvents; MCT, 100% CB, 100% HPKO, CB:HPKO(3:7) and CB:HPKO(5:5) with the mixture of emulsifier Span 20:Tween 80 in weight ratio of 1:9 were used to determine emulsions region formed. The similar fixed solvents were used as mentioned above. The phase inversion method was used in the formation of emulsions. The raw materials for the oil phase consisted of MCT, CB, HPKO and Span 20, while the raw materials for the water phase were distilled water, glycerol and Tween 80. The formulated emulsions were prepared by two combinations, one with the combination of MCT and the other without MCT. This two combinations were further prepared in 4 series which consisted of 100% CB, 100% HPKO, CB:HPKO in the weight ratios of 3:7 and 5:5. Carbopol ETD 2020 was used as a thickening agent in the formulation. The ratio of oil phase and water in formulation used was 2:8. After the emulsification process, the emulsions were kept at the temperature of 30°C. The emulsions stability could be determined by measuring the percentage volume in the separation phase between oil/water in the measuring cylinder. Polarized microscope is the best instrument

used to determine the characteristics of liquid crystalline phase. Optical microscope was used to determine the characteristics of emulsions. Finally, the rheology characteristics of the sample emulsions were measured using the Brookfield viscometer model 107 with a Brookfield temperature controller programme. For best result, the formulation with MCT forms better emulsions.

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