MOLECULAR ARRANGEMENT OF TRIACYLGLYCEROL IN SELF-ASSEMBLED AGGREGATE OF SINGULAR AND MIXED AMPHIPHILIC SYSTEM

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In my opinion, doing research is like running an off-road track. We may know in which direction we want to go; however, we can't foresee what will be coming along the way. The various natures of challenge we meet stimulate our mind and the passage of each obstacle gives a feeling of satisfaction and adds to the excitement of what is to come. Now, close to the finishing line of this run, I would like to address my sincere gratitude to the persons who have accompanied me along the course and those who have been there by the side to support me.

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A study was conducted to examine the lamellar liquid crystalline structure formed by surfactant, Dodecytrimethylammonium bromide (DTAB) in the presence of alcohols (various alkyl chain lengths) and secondary surfactant, Aerosol OT (AOT) as well as the effects on the liquid crystalline structure with additional of triacylglycerol into the system. Several ternary phase equilibriums were constructed using DTAB, AOT, water and various alcohols. The results showed that the DTAB/Water/Alcohol and DTAB+AOT/Water/Alcohol systems were able

to formed self-assembled aggregates like micelle, reversed micelle, and lyotropic liquid crystalline. From the optical pattern (POM observation), of the liquid crystalline samples, it was found that two types of liquid crystalline were formed, namely the hexagonal and lamellar liquid crystalline. Followed by that, medium-chain triglycerides (MCT) was added accordingly into the obtained lamellar liquid crystalline to examine the effect it drew upon the liquid crystalline. It is found that the DTAB/Water/Alcohol systems were able to accommodate approximately 4 to 5% of MCT before transforming into other structures. From the SAXS spectrum, it was found that the water concentration, alcohol's chain lengths and the presence of MCT had tremendous effects on the lattice spacing of the lamellar liquid crystalline.

Abstrak tesis yang dikemukakan kepada Senat Universiti Malaysia Terengganu sebagai memenuhi keperluan untuk Ijazah Master Sains

PENYUSUNAN MOLEKUL TRIASILGLISEROL SECARA AGREGAT HIMPUNAN SENDIRI DALAM SISTEM AMFIFILIK TUNGGAL DAN TERCAMPUR

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Suatu kajian telah dijalankan untuk mengkaji struktur hablur cecair lamela yang terbentuk oleh surfaktan, dodecyltrimethylammonium bromide (DTAB) dengan kehadiran alkohol (kepanjangan rantai alkil yang berbagai) dan surfaktan sekunder, Aerosol OT (AOT), seterusnya, kesan pada struktur hablur cecair lamela dengan penambahan triasilgliserol dalam sistem juga turut dikaji. Dalam kajian ini, beberapa gambaraja tiga fasa telah dibina dengan mengguna DTAB, air dan alkohol yang pelbagai. Keputusan menunjukkan bahawa sistem

DTAB/Air/Alkohol dan DTAB+AOT/Air/Alkohol boleh membentuk agregat himpunan sendiri seperti misel, misel berbalik dan hablur cecair "lyotropic". Daripada corak optik (pemerhatian daripada mikroskop berkutub) sampel hablur cecair, dua jenis hablur cecair telah diperhatikan, iaitu hablur cecair heksagon dan lamela. Triasilgliserol berantai sederhana (MCT) telah ditambahkan ke dalam sampel hablur cecair lamela untuk mengkaji kesan kehadirannya dalam sistem. Keputusan menunjukkan bahawa lamela DTAB/Air/Alkohol boleh menampung kira-kira 4 hingga 5% MCT sebelum berubah kepada struktur yang lain. Spektrum Sinaran X Berselerak Sudut Kecil menunjukkan bahawa kepekatan air, kepanjangan rantai alkil alkohol dan kehadiran MCT mempunyai kesan yang amat besar terhadap jarak kekisi hablur cecair lamela.