

**OPTIMASI PEMBUATAN MIKROEMULSI LIKOPEN
DARI EKSTRAK KLOROFORM BUAH TOMAT
(*Solanum lycopersicum* L.) BERDASARKAN
DIAGRAM TIGA FASA**

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ABSTRAK

Likopen merupakan senyawa metabolit sekunder golongan karotenoid yang banyak terdapat dalam buah tomat (*Solanum lycopersicum* L.). Likopen bersifat non polar dan memiliki aktivitas antioksidan yang sangat tinggi sehingga dapat melindungi kulit dari radikal bebas. Tujuan dari penelitian ini adalah untuk mengoptimasi formula mikroemulsi berdasarkan diagram tiga fasa. Komponen mikroemulsi terdiri dari *Virgin Coconut Oil* (VCO) sebagai fasa minyak, tween 80 sebagai surfaktan, dan gliserin sebagai kosurfaktan. Diagram tiga fasa dirancang dengan berbagai komposisi dari fasa minyak: air: surfaktan-kosurfaktan (2-63%):(30-80%):(2-63%) dan perbandingan surfaktan:kosurfaktan adalah 4:1 sehingga dihasilkan 54 formula basis. Diagram tiga fasa menunjukkan sebuah wilayah mikroemulsi yang terdiri dari 9 formula basis mikroemulsi. Basis mikroemulsi dilakukan evaluasi meliputi pemeriksaan organoleptis, pengukuran turbiditas dan transmitan, pH, tegangan permukaan, tipe emulsi, uji stabilitas fisik (*cycling test* dan uji sentrifugasi), pengukuran viskositas, bobot jenis, dan ukuran globul, diperoleh 7 formula basis yang stabil. Selanjutnya dibuat sediaan mikroemulsi dengan zat aktif likopen dari ekstrak kloroform buah tomat. Sediaan mikroemulsi likopen dievaluasi dengan cara yang sama dan didapatkan sediaan paling stabil dengan formula fasa minyak: air: surfaktan-kosurfaktan 7:30:63 dengan karakteristik pengamatan organoleptis yang tidak berubah selama penyimpanan, rata-rata nilai persen transmitan 96,5%, pH rata-rata 7,36, tegangan permukaan 46,44 dyne/cm, tipe emulsi m/a, stabil secara fisik, viskositas rata-rata 10293,3 cP, bobot jenis 1,0843 g/ml, ukuran globul rata-rata 232,13 nm, dan tidak menyebabkan iritasi pada kulit.

Kata kunci: optimasi, mikroemulsi, likopen, tomat, diagram tiga fasa

**OPTIMIZATION OF LYCOPENE MICROEMULSION
MANUFACTURING FROM TOMATO (*Solanum lycopersicum* L.)
CHLOROFORM EXTRACT BASED ON PSEUDO-TERNARY PHASE
DIAGRAM**

ABSTRACT

Lycopene is a secondary metabolite of carotenoid group found in tomato (*Solanum lycopersicum* L.). Lycopene is non-polar and has a potent antioxidant activity which protects the skin from free radicals. The objective of this study is to optimize the formula of microemulsion based on a pseudo-ternary phase diagram. The components of microemulsion were Virgin Coconut Oil (VCO) as oil phase, tween 80 as surfactant, and glycerin as cosurfactant. Pseudo-ternary phase diagram is designed at various composition of the oil phase: water: surfactant-cosurfactant (2-63%):(30-80%):(2-63%) and the ratio of surfactant:cosurfactant was 4:1, resulting 54 base formulas. Pseudo-ternary phase diagram showed a microemulsion area consisted of 9 microemulsion bases. The microemulsion bases were evaluated including organoleptic examination, measurement of turbidity and transmittance, pH, surface tension, type of emulsion, physical stability test (cycling test and centrifugation test), measurement of viscosity, density, and globule size. Seven stable microemulsion bases were obtained. Furthermore, microemulsion products were made with lycopene from tomato chloroform extract as an active ingredient. Lycopene microemulsion products were evaluated in the same manner and the most stable microemulsion was obtained with the ratio of oil phase: water: surfactant-cosurfactant of 7:30:63 with characteristic of organoleptic examination that did not change during storage, the average of percent transmittance value was 96.5%, the average pH was 7.36, the surface tension was 46.44 dyne/cm, the emulsion type was o/w, physically stable, the average viscosity was 10293.3 cP, the density was 1.0843 g/ml, the average globule size was 232.13 nm, and did not cause skin irritation.

Keywords: optimization, microemulsion, lycopene, tomato, pseudo-ternary phase diagram