ABSTRAK

Pengobatan hiperpigmentasi dapat dilakukan dengan beberapa senyawa salah satunya adalah *kojic acid* dengan cara menghambat produksi dari tirosinase bebas dan juga antioksidan yang kuat. Nanoemulsi menjadi sistem yang sangat menjanjikan dalam peningkatan mutu kosmetik. Tujuan penelitian ini untuk mengetahui konsentrasi fase minyak VCO dan surfaktan tween 80 yang optimal dalam formulasi nanoemulsi dan mengetahui efektivitas *kojic acid* dalam menghambat enzim tirosinase. Penelitian dibuat dengan metode *spontaneous emulsification*, dilakukan uji karakteristik meliputi pengamatan organoleptis, pengukuran sifat fisik dan juga stabilitas fisik, dengan desain faktorial 2 faktor 2 level yang dianalisis menggunakan software *Design Expert Version 13* dengan tingkat kepercayaan 95%.

Hasil penelitian menunjukkan bahwa Tween 80 dan VCO mempengaruhi kejernihan dan besaran partikel yang dihasilkan nanoemulsi *kojic acid* dengan persen kontribusi sebesar 16,86%. Area optimum didapatkan dengan *superimposed contour plot*. Pengujian efektivitas nanoemulsi *kojic acid* dilakukan dengan melihat % penghambatan yang dihasilkan oleh sediaan *kojic acid*, yang diukur pada panjang gelombang 510 nm dengan suhu inkubasi 25^0C yang dilakukan setiap 2 menit sekali selama 20 menit dan dihasilkan % penghambatan sebesar 17,64%.

Kata Kunci : Nanoemulsi, *kojic acid*, tween 80, *VCO*, faktorial, % penghambatan

ABSTRACT

Treatment of hyperpigmentation can be done with several compounds, one of which is kojic acid by inhibiting the production of free tyrosinase and is also a powerful antioxidant. Nanoemulsion is a very promising system in improving the quality of cosmetics. The purpose of this study was to determine the optimal concentration of VCO oil phase and tween 80 surfactant in nanoemulsion formulation and to determine the effectiveness of kojic acid in inhibiting tyrosinase enzyme. The study was made by spontaneous emulsification method, characteristic tests were conducted including organoleptic observation, measurement of physical properties and also physical stability, with a 2-factor 2-level factorial design analyzed using Design Expert Version 13 software with a 95% confidence level.

The results showed that Tween 80 and VCO influenced the clarity and particle size of kojic acid nanoemulsion with a percent contribution of 16.86%. The optimum area was obtained by superimposed contour plot. Testing the effectiveness of kojic acid nanoemulsion was carried out by looking at the % inhibition produced by kojic acid preparations, which was measured at a wavelength of 510 nm with an incubation temperature of 250C which was carried out every 2 minutes for 20 minutes and resulted in a % inhibition of 17.64%.

Keywords *: Nanoemulsi, kojic acid, tween 80, VCO, factorial, % inhibition*