ABSTRAK

Pengembangan Formulasi dan Karakterisasi NLC (*Nanostrucruted Lipid Carriers)* Vitamin E Asetat dengan Metode *Simplex Lattice Design* Menggunakan Lipid Padat *Glyceryl Behenate* (Compritol ATO®) dan Surfaktan *Polyoxyethylene Castor Oil* (Cremophor RH 40®).

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Penuaan kulit merupakan permasalahan terdapatnya kerutan wajah, bintik hitam, dan pigmentasi yang tidak merata. Dipengaruhi oleh dua faktor intrinsik dan ekstrinsik. Vitamin E Asetat memiliki mekanisme antioksidan, gugus hidroksil pada cincin kromanol yang menjadi donor atom hidrogen dapat mereduksi radikal bebas. *Nanostructured Lipid Carriers* merupakan metode sistem berbasis nanopartikel lipid yang dapat meningkatkan stabilitas dan penetrasi, terdiri dari lipid padat, lipid cair dan surfaktan. Tujuan penelitian untuk mengetahui keberhasilan formulasi Vitamin E Asetat yang memenuhi parameter. Metode pembentukan NLC Vitamin E Asetat menggunakan homogenisasi panas dilanjutkan dengan sonikasi menggunakan sonikator probe. Formula NLC Vitamin E Asetat yang digunakan Vitamin E Asetat 2%, Compritol ATO® 2%-6%, Myritol® 1%, Cremophor RH 40® 1%-3%. Hasil evaluasi menunjukkan hasil ukuran dengan rentang 107 nm±1.17- 742.4nm±96.0, hasil indek polidispersitas 0.13±0.037-0.721±0.044, zeta potensial 10.24 mV±9.143 sampai -23.63 mV±1.446, dan pengujian efisiensi penjerapan 91.28%-97.52%. Hasil TEM menunjukan morfologi partikel berbentuk bulat. Berdasarkan hasil penelitian dapat disimpulkan NLC Vitamin E Asetat dapat diformulasikan menggunakan lipid padat *Glyceryl Behenate* (Compritol®) dan surfaktan *Polyoxyethylene Castor Oil* (Cremophor RH 40®). Hasil karakterisasi formula NLC Vitamin E Asetat tidak memenuhi persyaratan.

Kata kunci: Nanostructured Lipid Carriers, vitamin E Asetat, penuaan kulit

ABSTRACT

Development of Formulation and Characterization of NLC (Nanostrucruted Lipid Carriers) Vitamin E Acetate with Simplex Lattice Design Method Using Solid Lipid Glyceryl Behenate (Compritol ATO®) and Surfactant Polyoxyethylene Castor Oil (Cremophor RH 40®).

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Skin aging is a problem with facial wrinkles, dark spots, and uneven pigmentation. Influenced by two factors intrinsic and extrinsic. Vitamin E Acetate has an antioxidant mechanism, the hydroxyl group on the chromanol ring which becomes a hydrogen atom donor can reduce free radicals. Nanostructured Lipid Carriers is a systemic method based on lipid nanoparticles that can improve stability and penetration, consisting of solid lipids, liquid lipids, and surfactants. The purpose of the study was to determine the success of the Vitamin E Acetate formulation that met the parameters. The method of formation of NLC Vitamin E Acetate uses heat homogenization followed by sonication using a probe sonicator. NLC Vitamin E Acetate formula used Vitamin E Acetate 2%, Compritol ATO® 2%-6%, Myritol® 1%, Cremophor RH 40® 1%-3%. The results of the evaluation showed the size results in the range of 107 nm±1.17-742.4nm±96.0, the results of the polydispersity index were 0.13±0.037-0.721±0.044, the zeta potential was 10.24 mV±9.143 to -23.63 mV±1.446, and the adsorption efficiency test was 91.28%-97.52%. . The TEM results show the morphology of the spherical particles. Based on the research results, it can be concluded that NLC Vitamin E Acetate can be formulated using solid lipid Glyceryl Behenate (Compritol®) and surfactant Polyoxyethylene Castor Oil (Cremophor RH 40®). The results of the characterization of the NLC Vitamin E Acetate formula did not meet the requirements.

Keywords: Nanostructured Lipid Carriers, vitamin E Acetate, skin aging