

INTISARI

Paparan sinar UVA yang berlebihan dapat merusak lapisan dermis kulit sehingga menyebabkan *photoaging* dan kanker kulit. Avobenzone adalah *sunscreen* spektrum luas yang dapat melindungi kulit dari radiasi UVA. Namun, avobenzone bersifat fotolabil sehingga efektivitasnya menurun ketika terpapar cahaya. Penelitian ini bertujuan untuk mengoptimasi konsentrasi *glycerin* dan tween 20 dalam formula serum *sunscreen* avobenzone agar didapatkan sediaan serum dengan sifat fisik dan stabilitas yang optimal. Selain itu, ditambahkan vitamin E ke dalam formula serum *sunscreen* avobenzone untuk memperbaiki fotostabilitasnya.

Optimasi dilakukan menggunakan metode *Simplex Lattice Design* (SLD) melalui *software Design Expert* versi 13. Dilakukan uji stabilitas dengan metode *cycling test* dan uji fotostabilitas dengan sumber cahaya buatan. Parameter yang diuji meliputi organoleptis, homogenitas, viskositas, pH, diameter sebar, daya lekat, SPF, dan antioksidan. Data akan dianalisis secara statistik melalui *software IBM SPSS Statistic 25*.

Hasil penelitian menunjukkan formula optimum serum *sunscreen* avobenzone terdiri dari *glycerin* 15,64% dan tween 20 14,36% dengan nilai pH $5,46 \pm 0,03$, viskositas $482,83 \pm 15$ cP, diameter sebar $6,12 \pm 0,2$ cm, dan daya lekat $1,06 \pm 0,02$ detik. Formula optimum serum *sunscreen* avobenzone stabil selama uji stabilitas. Penambahan vitamin E dalam serum *sunscreen* avobenzone dapat memperbaiki fotostabilitas serum *sunscreen* avobenzone.

Kata kunci: *Sunscreen*, Avobenzone, Antioksidan, Vitamin E, Fotostabilitas

ABSTRACT

Excessive exposure to UVA rays can damage the dermis layer of the skin, leading to photoaging and skin cancer. Avobenzone is a broad-spectrum sunscreen that can protect the skin from UVA radiation damage. However, avobenzone is photolabile so its effectiveness decreases when exposed to light. This study aims to optimize the concentration of glycerin and tween 20 in the avobenzone sunscreen serum formula to obtain a serum preparation with optimal physical properties and stability. In addition, vitamin E was added to the avobenzone sunscreen serum formula to improve its photostability.

Optimization was carried out using the Simplex Lattice Design (SLD) method through Design Expert software version 13. Stability test with cycling test method and photostability test with artificial light source were conducted. The parameters tested included organoleptics, homogeneity, viscosity, pH, spreadability, adhesion, SPF, and antioxidants. Data will be statistically analyzed through IBM SPSS Statistic 25 software.

The results showed that the optimum formula of avobenzone serum sunscreen consisted of glycerin 15,64% and tween 20 14,36% with a pH value of $5,46 \pm 0,03$; viscosity $482,83 \pm 15$ cP, spreadability $6,12 \pm 0,2$ cm; and adhesion $1,06 \pm 0,02$ seconds. The optimum formula of avobenzone serum sunscreen was stable during the stability test. The addition of vitamin E in avobenzone serum sunscreen can improve the photostability of avobenzone serum sunscreen.

Keywords: Sunscreen, Avobenzone, Antioxidant, Vitamin E, Photostability