

## ABSTRAK

Judul : Optimasi Tween 80 dan Span 80 pada Formula Emulgel Minyak  
Atsiri *Peppermint* dengan Metode *Simplex Lattice Design*  
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Minyak atsiri *peppermint* mengandung senyawa *menthol*, *menthofuran*, *cineole*, dan *limonene*, yang digunakan sebagai anti iritan maupun sebagai antioksidan, minyak atsiri *peppermint* dapat dibuat dalam bentuk emulgel. Dalam penelitian ini digunakan tween 80 dan span 80 sebagai kombinasi *emulsifying agent*. Penelitian ini bertujuan untuk mengetahui formula optimum dari emulgel minyak atsiri *peppermint* kombinasi *emulsifying agent* menggunakan metode *simplex lattice design*, mengetahui sifat fisik dari emulgel minyak atsiri *peppermint* dengan kombinasi tween 80 dan span 80, dan stabilitas sediaan emulgel minyak atsiri *peppermint* kombinasi *emulsifying agent* yang optimum menggunakan metode *cycling test*. Minyak atsiri *peppermint* diperoleh dengan metode distilasi uap dan air kemudian dianalisis secara kualitatif metode GC-MS. *Simplex lattice design* digunakan untuk optimasi kombinasi *emulsifying agent* dengan uji pH, uji daya sebar, dan uji daya lekat sebagai respon. Hasil uji sifat fisik (pH, daya lekat, daya sebar) diolah menggunakan uji ANOVA. Analisis data diverifikasi menggunakan *one simple t test*. Uji stabilitas fisik dilakukan uji pH, daya lekat, daya sebar, organoleptis, homogenitas, dan viskositas menggunakan metode *cycling test*. Hasil formula optimum sediaan emulgel minyak atsiri *peppermint* yaitu 5,33 % tween 80 dan 4,67 % span 80 dengan respon uji pH 5,35, uji daya lekat 10,43 detik, dan daya sebar 5,36 cm. Hasil stabilitas fisik menunjukkan hasil yang stabil. Dapat disimpulkan bahwa formula optimum emulgel minyak atsiri *peppermint* telah memenuhi standar sediaan emulgel yang baik.

**Kata kunci:** Emulgel, *Peppermint*, *Design Expert*, *Simplex lattice design*, *One sample t-test*.

**ABSTRACT**

*Title : Optimization of Tween 80 and Span 80 For Emulgel Peppermint Essential Oil Formula Using Simplex Lattice Design Method*

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*Peppermint essential oil contains menthol, menthofuran, cineole, and limonene compounds, which are used as anti-irritants and antioxidants. Peppermint essential oil can be made emulgel. In this study tween 80 and span 80 were used as a combination of emulsifying agents. This study aims to determine the optimum formula of emulgel peppermint essential oil combination tween 80 and span 80 using the simplex lattice design method, determine the physical properties of emulgel peppermint essential oil with combination of emulsifying agent, and optimum stability of emulgel preparations of peppermint essential oil combination of emulsifying agent using the cycling test method. Peppermint essential oil was obtained by steam and water distillation and then analyzed by GC-MS method. Simplex lattice design was used to optimize the combination of emulsifying agent with pH test, spreadability test, and adhesion test as a response. The results of the physical properties test (pH, adhesion, spreadability) were managed using the ANOVA test. Data analysis was verified using one sample t test. The physical stability test was carried out by testing pH, adhesion, spreadability, organoleptic, homogeneity, and viscosity using the cycling test method. The results of the optimum formula for emulgel peppermint essential oil preparations were 5.33% tween 80 and 4.67% span 80 with pH test response of 5.35, an adhesiveness test of 10.43 seconds, and a spreading power of 5.36 cm. The results of physical stability show stable results. It can be concluded that the optimum emulgel formula of peppermint essential oil meets the standards of good emulgel preparations.*

***Keywords:*** *Emulgel, Peppermint, Design Expert, Simplex lattice Design, One sample t-test.*