FORMULASI DAN EVALUASI FISIK *HYDROGEL PATCH* ULTRASPHERES® 8041 *UNDER EYE* BERBASIS HPMC DENGAN *DESIGN EXPERT* MENGGUNAKAN METODE *SIMPLEX LATTICE DESIGN* (SLD)

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INTISARI

Latar belakang : Ultraspheres® 8041 merupakan pengembangan produk dari enkapsulasi gabungan aktif hidrofilik dan lipofilik yang mengandung vitamin A, C, E. Bentuk sediaan berupa cairan berminyak menyebabkan ketidaknyamanan kulit sehingga efikasi yang diharapkan tidak tercapai jika digunakan langsung pada permukaan kulit. Oleh karena itu, dibutuhkan *hydrogel patch* yang diharapkan akan meningkatkan kenyamanan dan efikasinya.
Tujuan : Penelitian ini bertujuan untuk mengembangkan formulasi sediaan *hydrogel patch under eye* ultraspheres® 8041 dengan vitamin A, C, dan E, melakukan uji fisik yang baik serta mengetahui aktivitas antioksidan.
Metode : Pembuatan formulasi *hydrogel patch* menggunakan zat aktif ultraspheres® 8041 dengan basis HPMC, propilen glikol sebagai *plasticizer* dan akuades sebagai pelarut dimana diawali dengan desain optimasi dan preparasi basis *hydrogel patch*, preparasi formula optimasi dan evaluasi fisik *hydrogel patch*, penentuan formula optimum *hydrogel patch*, pembuatan dan evaluasi fisik formula optimum *hydrogel patch*, verifikasi formula optimum *hydrogel patch* dilakukan evaluasi fisik berupa uji organoleptis, uji pH, ketebalan, uji *loss on drying*, uji *folding endurance*, dan uji aktivitas antioksidan dengan DPPH.
Hasil : Data formulasi hasil formula optimum *design expert* dengan metode *simplex lattice design* (SLD) yaitu HPMC 3,0% dan propilen glikol 7,0%. Uji organoleptis mendapatkan hasil putih keruh, tidak berbau, halus dan elastis, serta lengket; pH 5,47; ketebalan 0,73; *loss on drying* 40,58%; *folding endurance* 300 kali lipatan; serta aktivitas antioksidan yaitu 1108,0045 μg/mL yang mengartikan bahwa aktivitas antioksidannya sangat lemah.
Kesimpulan : *Design expert* dengan metode *simplex lattice design* (SLD) dapat digunakan untuk menentukan formula optimum *hydrogel patch* ultraspheres® 8041 berbasis HPMC dimana dengan hasil uji evaluasi fisik yang baik namun ada beberapa uji yang tidak sesuai dengan prediksi *software* tersebut.

Kata kunci : Ultraspheres® 8041, *Hydrogel Patch*, HPMC, *Simplex Lattice Design*, Antioksidan

FORMULATION AND EVALUATION OF PHYSICAL HYDROGEL PATCH ULTRASPHERES® 8041 UNDER EYE BASED ON HPMC BY EXPERT DESIGN USING SIMPLEX LATTICE DESIGN (SLD) METHOD

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ABSTRACT

Background : Ultraspheres® 8041 is a product development from a combined encapsulation of hydrophilic and lipophilic actives containing vitamins A, C, E. The dosage form is an oily liquid causing skin discomfort so that the expected efficacy is not achieved if used directly on the skin surface. Therefore, a hydrogel patch is needed which is expected to increase its comfort and efficacy.
Objective : This study aims to develop hydrogel patch preparation formulation under eye Ultraspheres® 8041 with vitamins A, C, and E, performing good physical tests as well as knowing antioxidant activity.
Method : Manufacture of a hydrogel patch formulation using an ultraspheres® 8041 active substance with HPMC base, propylene glycol as a plasticizer and acuades as a solvent where prefixed with optimization design and preparation of the patch hydrogel base, preparation of optimization formula and physical evaluation of the patch hydrogel, determination of optimum formula of the patch hydrogel, preparationAqueous and physical evaluation of the optimum hydrogel patch formula, verification of the optimum hydrogel patch formula are performed physical evaluation of organoleptic test, pH test, thickness test, loss on drying test, endurance molding test, and antioxidant activity test with DPPH.
Results: Formulation data resulted from design expert's optimum formula using the simplex lattice design (SLD) method, namely HPMC 3.0% and propylene glycol 7.0%. The organoleptic test obtained a cloudy white result, odorless, smooth and elastic, and sticky; pH 5.47; thickness 0.73; loss on drying 40.58%; folding endurance 300 times; and antioxidant activity of 1108.0045 g/mL which means that the antioxidant activity is very weak.
Conclusion: Design expert with the simplex lattice design (SLD) method can be used to determine the optimum formula for the HPMC-based ultraspheres® 8041 hydrogel patch where the results of the physical evaluation test are good but there are some tests that do not match the predictions of the software.

Keywords : Ultraspheres® 8041, Hydrogel Patch, HPMC, Simplex Lattice Design, Antioxidant