

## Formulasi dan Evaluasi Fisik *Patch Hydrogel* Phytosolve® 4021 Berbasis Xanthan Gum dengan *Design Expert* Metode *D-Optimal*

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### INTISARI

**Latar belakang:** Phytosolve® 4021 mengandung Koenzim Q<sub>10</sub> (CoQ<sub>10</sub>) yang memiliki peran sebagai antioksidan 10 kali lebih tinggi apabila digunakan secara lokal, sehingga dibuatlah menjadi sediaan *patch hydrogel*.

**Tujuan:** Penelitian ini untuk mengembangkan formulasi sediaan *patch hydrogel* phytosolve® 4021 berbasis xanthan gum, mengevaluasi fisik dan mengetahui aktivitas antioksidan *patch hydrogel*.

**Metode:** Penelitian terdiri dari desain optimasi basis *patch hydrogel*, pembuatan *patch* dan pengujian fisik *patch*, penentuan formula optimum, verifikasi formula optimum, uji evaluasi fisik berupa uji organoleptis, pH, ketebalan, *folding endurance*, dan *loss on drying*, serta uji antioksidan.

**Hasil:** Berdasarkan *Design Expert*® versi 9.0 formula optimum yang direkomendasikan yaitu xanthan gum 0,6%; propilen glikol 10,1%; gliserin 2%. Uji organoleptis menghasilkan warna kuning agak transparan, bau khas, tekstur halus, licin dan lembut, daya lekatnya lengket; pH 4,76; ketebalan *patch* 0,44 mm; *folding endurance* 300 lipatan; *loss on drying* 29,44% serta aktivitas antioksidan phytosolve® 4021 20982,409 ug/mL; *patch hydrogel* 13873,032 ug/mL menunjukkan aktivitas antioksidannya sangat lemah.

**Kesimpulan:** Desain *D-Optimal* dapat digunakan untuk menentukan formula optimum *patch hydrogel* phytosolve® 4021 berbasis xanthan gum dengan hasil uji evaluasi fisik sesuai prediksi. Namun, hasil uji antioksidan *patch* yang diperoleh sangat lemah.

**Kata kunci:** Phytosolve, *patch hydrogel*, xanthan gum, *D-Optimal Design*, uji antioksidan

## Formulation and Physical Evaluation of Xanthan Gum-Based Hydrogel Patch Phytosolve® 4021 with Expert Design D-Optimal Method

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### ABSTRACT

**Background:** Phytosolve® 4021 contains Coenzyme Q<sub>10</sub> (CoQ<sub>10</sub>) which has a 10 time higher antioxidant role when used locally, so that patch hydrogel is made as preparation.

**Objectives:** The aim of this study is to develop the formulation of xanthan gum-based patch hydrogel phytosolve® 4021, evaluate the physical, and know the antioxidant activity of hydrogel patch.

**Method:** This study consisted of designing base optimization patch hydrogel, make patch hydrogel and physical test of patch hydrogel, determining the optimum formula of patch hydrogel, verifying optimum formula of patch hydrogel, physical evaluation in the form of organoleptic test, pH test, thickness test, folding endurance test, and loss on drying test, as well as antioxidant activity test.

**Results:** Based on Design Expert® version 9.0 the recommended optimum formula is xanthan gum 0.6%; propylene glycol 10.1%; glycerin 2%. Organoleptic testing produces a little transparent yellow color, distinctive odor, smooth texture, sleekness and softness as well as its adhesive force is sticky; pH 4.76; patch thickness 0.44 mm; folding endurance 300 times fold; loss on drying 29.44% as well as phytosolve® 4021 antioxidant activity test 20982,409 ug/mL and xanthan gum-based hydrogel patch 13873.032 ug/mL exhibit extremely weak antioxidant activity.

**Conclusion:** D-Optimal Design can be used to determine optimum formula of xanthan gum-based patch hydrogel phytosolve® 4021, in which the results of physical evaluation has been in accordance with the prediction and very weak obtained antioxidant test results.

**Keywords:** Phytosolve, patch hydrogel, xanthan gum, D-Optimal Design