

INTISARI

Senyawa 3-nitrokalkon diduga mampu menyerap dan mengurangi intensitas radiasi sinar ultraviolet yang terpapar pada kulit. Senyawa 3-nitrokalkon diformulasikan dalam bentuk sediaan gel dengan kombinasi karbopol dengan kadar 0,50-1,00% b/b; natrium karboksimetilselulosa dengan kadar 0,50-2,00% b/b; dan metilselulosa dengan kadar 1,00-3,00% b/b. Tujuan penelitian ini adalah mengoptimasi ketiga basis gel tersebut, mengevaluasi sifat fisik, stabilitas fisik, dan aktivitas gel 3-nitrokalkon sebagai *sunscreen* secara *in vitro*.

Metode *Simplex Lattice Design* (SLD) digunakan untuk mengoptimasi basis gel dengan bantuan *software Design Expert* versi 10.0. Aktivitas *sunscreen* gel 3-nitrokalkon ditentukan secara spektrofotometri dengan cara menentukan nilai *Sun Protecting Factor* (SPF), persen transmisi eritema (%TE), dan persen transmisi pigmentasi (%TP). Data dianalisis secara statistik dengan *software IBM SPSS Statistic 25*.

Formula optimum gel 3-nitrokalkon dengan kadar karbopol sebesar 0,51% b/b; kadar natrium karboksimetilselulosa sebesar 1,89% b/b; dan kadar metilselulosa sebesar 1,60% b/b memiliki pH sebesar 6,522; viskositas sebesar 135,20 dPa.s; daya sebar sebesar 15,1 cm²; daya lekat sebesar 90,02 detik; nilai SPF sebesar 21,19; nilai %TE sebesar 1,27%; nilai %TP sebesar 43,47%; dan memiliki sifat fisik yang relatif stabil.

Kata kunci: gel, 3-nitrokalkon, SLD, *sunscreen*

ABSTRACT

The 3-nitrochalcone was suspected to absorb and reduce ultraviolet radiation intensity that exposed to the skin. The 3-nitrochalcone was formulated as gel dosage form using combination of carbopol in concentration of 0.50-1.00% w/w; carboxymethylcellulose sodium in concentration of 0.50-2.00% w/w; and methylcellulose in concentration of 1.00-3.00% w/w. This study's purpose was to optimize the three gel bases, evaluate physical properties, physical stability, and activity of 3-nitrochalcone gel as sunscreen by *in vitro* method.

Simplex Lattice Design (SLD) method was used to optimize gel base with Design Expert software version 10.0. Activity of 3-nitrochalcone gel as sunscreen was determined spectrophotometrically by determining Sun Protecting Factor (SPF) value, percent transmission of erythema (% TE), and percent transmission of pigmentation (% TP). Data were analyzed statistically with IBM SPSS Statistic 25 software.

Optimum formula of 3-nitrochalcone gel with 0.51% w/w carbopol content, 1.89% w/w carboxymethylcellulose sodium content, and 1.60% w/w methylcellulose content has pH of 6.522, viscosity of 135.20 dPa.s, spreadability of 15.1 cm², adhesive time of 90.02 seconds, SPF value of 21.19, %TE value of 1.27%, %TP value of 43.47%, and relatively stable physical properties.

Keywords: gel, 3-nitrochalcone, SLD, sunscreen