



SINTESIS TURUNAN SINAMAT DAN UJI AKTIVITASNYA SEBAGAI SENYAWA TABIR SURYA

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INTISARI

Sintesis senyawa turunan sinamat sebagai senyawa aktif tabir surya telah dilakukan. Senyawa turunan sinamat tersebut divariasikan substituenya dan disintesis melalui reaksi kondensasi Claisen-Schmidt untuk mendapatkan senyawa tabir surya dengan sifat yang diinginkan meliputi serapan yang lebar pada daerah UV. Sintesis yang dilakukan hanya dalam satu tahap yaitu melalui proses refluks selama 24 jam pada suhu 15-80 °C. Senyawa yang disintesis antara lain yaitu isoamil sinamat, isoamil 3,4-dimetoksisinamat, dan isoamil 2,4-diklorosinamat. Produk sintesis dianalisis menggunakan spektrometer FT-IR, GC-MS, dan ¹H-NMR. Pengujian senyawa tabir surya dilakukan dengan spektrofotometer UV-Vis berupa penentuan serapan λ_{maks} pada daerah UVA- UVB dan perhitungan nilai SPF (*Sun Protection Factor*).

Hasil penelitian menunjukkan senyawa isoamil 2,4-diklorosinamat, isoamil sinamat, dan isoamil 3,4-dimetoksisinamat diperoleh berupa minyak berwarna coklat tua dengan persen hasil berturut-turut 40,1, 35,0 dan 33,0%. Serapan UV-Vis isoamil 2,4-diklorosinamat, isoamil sinamat, dan isoamil 3,4-dimetoksisinamat menunjukkan profil serapan elektronik pada daerah UVA-UVC dengan nilai absorbansi maksimum berturut-turut pada 270, 290 dan 330 nm. Nilai SPF masing-masing senyawa berturut-turut sebesar 76,5, 9,9 dan 2,6. Berdasarkan hasil tersebut, dapat disimpulkan bahwa senyawa isoamil sinamat dan turunannya memiliki aktivitas tabir surya.

Kata kunci: kondensasi, sinamat, SPF (*Sun Protection Factor*), dan tabir surya



SYNTHESIS OF CINNAMATE DERIVATIVES AND THEIR ACTIVITY TEST AS SUNSCREEN COMPOUNDS

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ABSTRACT

Synthesis of cinnamate derivatives as active compounds of sunscreen has been carried out. The cinnamate derivative compound was varied by its substituent and synthesized through the Claisen-Schmit condensation reaction to obtain the sunscreen compound with the desired properties including wide absorption in the UV region. Synthesis is carried out only in one step, namely through a reflux process for 24 hours at 15-80 °C. The synthesized compounds include isoamyl cinnamate, isoamyl 3,4-dimethoxycinnamate, and isoamyl 2,4-dichlorocinnamate. The synthesis products were analyzed using FT-IR, GC-MS, and ¹H-NMR spectrometers. Testing of sunscreen compounds was carried out by UV-Vis spectrophotometer in the form of λ_{max} absorption in the UVA-UVB region and the calculation of SPF (Sun Protection Factor) values.

The results showed that the isoamyl 2,4-dichlorocinnamate compound, isoamyl cinnamate, and isoamyl 3,4-dimethoxycinnamate were obtained in the form of dark brown oil with 40.1, 35.0, and 33.0% of yield. Isolated UV-Vis uptake of isoamyl 2,4-dichlorocinnamate, isoamyl cinnamate, and isoamyl 3,4-dimethoxy cinnamate showed electronic absorption profiles in the UVA-UVC region with maximum absorbance values of 270, 290, 330 nm respectively. The SPF values of each compound were 76.5, 9.9, and 2.6 respectively. Based on these results, it can be concluded that the isoamyl cinnamate compound and its derivatives have sunscreen activity.

Key word: condensation, cinnamate, SPF (Sun Protection Factor), sunscreen